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The Metal Worker

A WEEKLY JOURNAL OF THE ROOFING, CORNICE, STOVE, TIN, PLUMBING AND HEATING TRADES.

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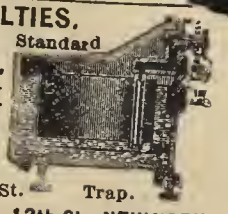
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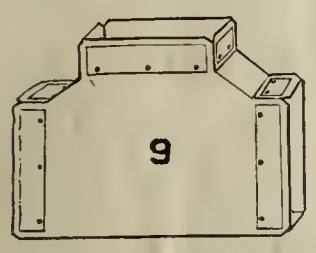
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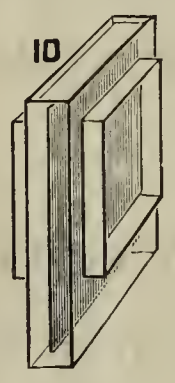
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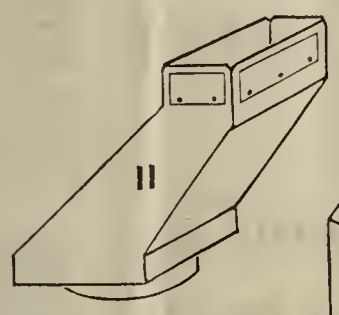
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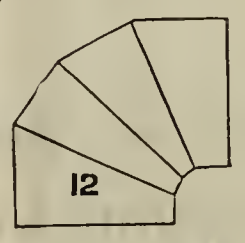
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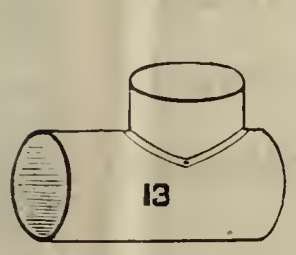
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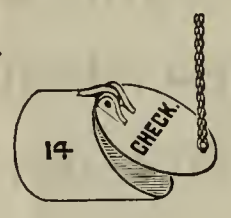


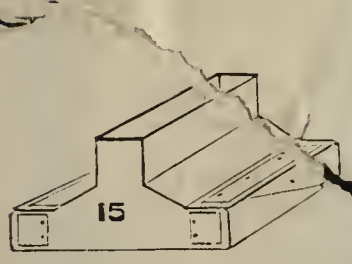






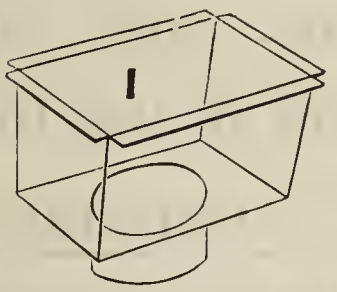


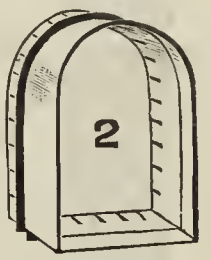


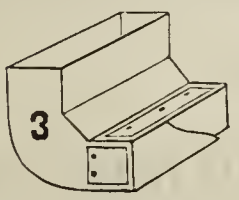


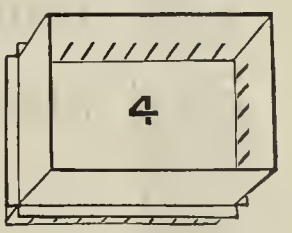


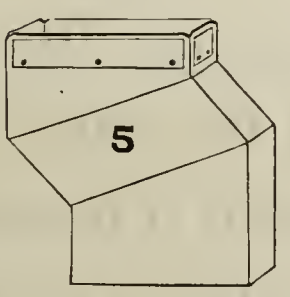
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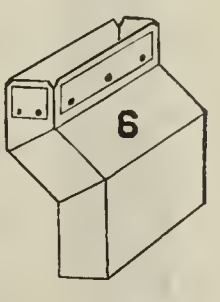


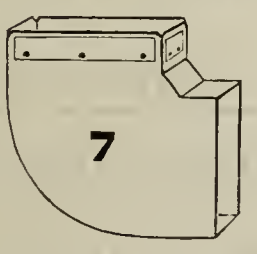


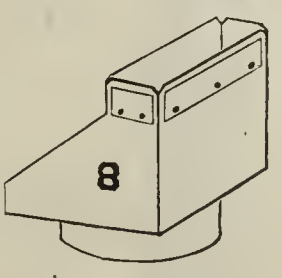












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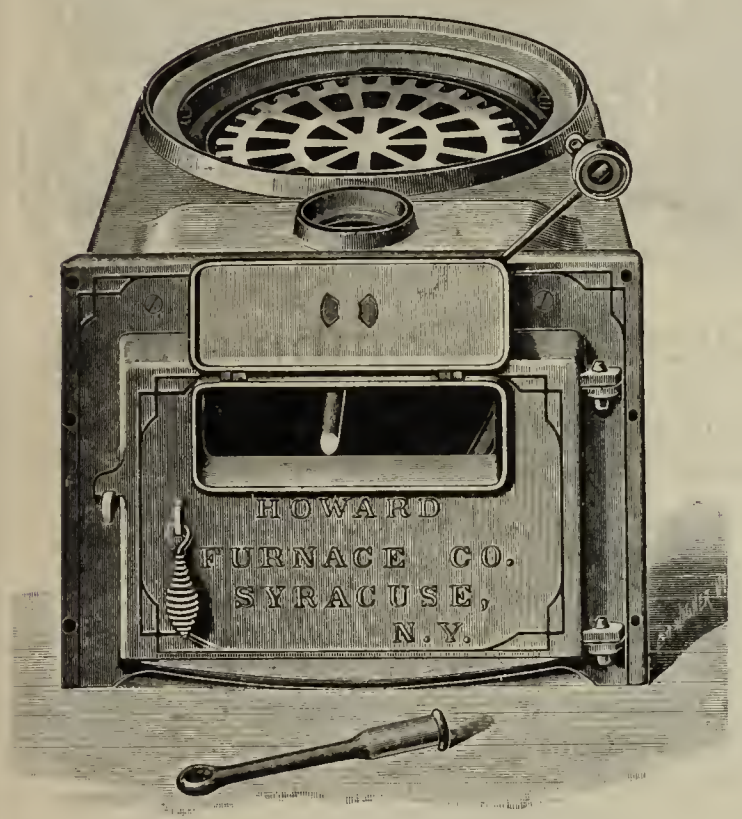
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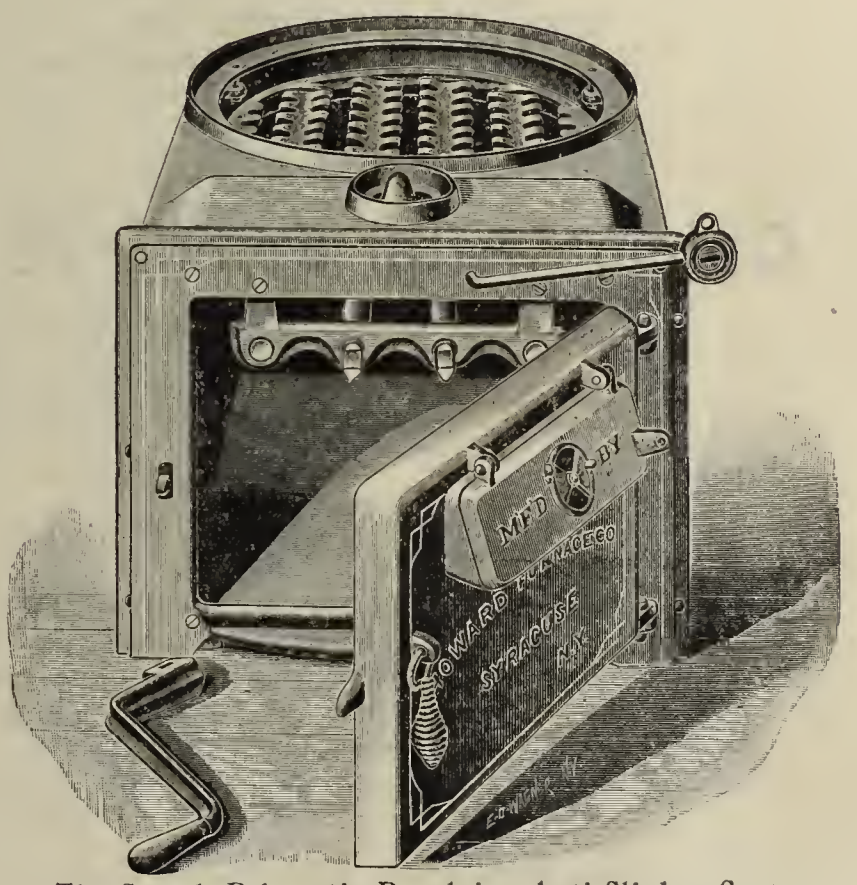
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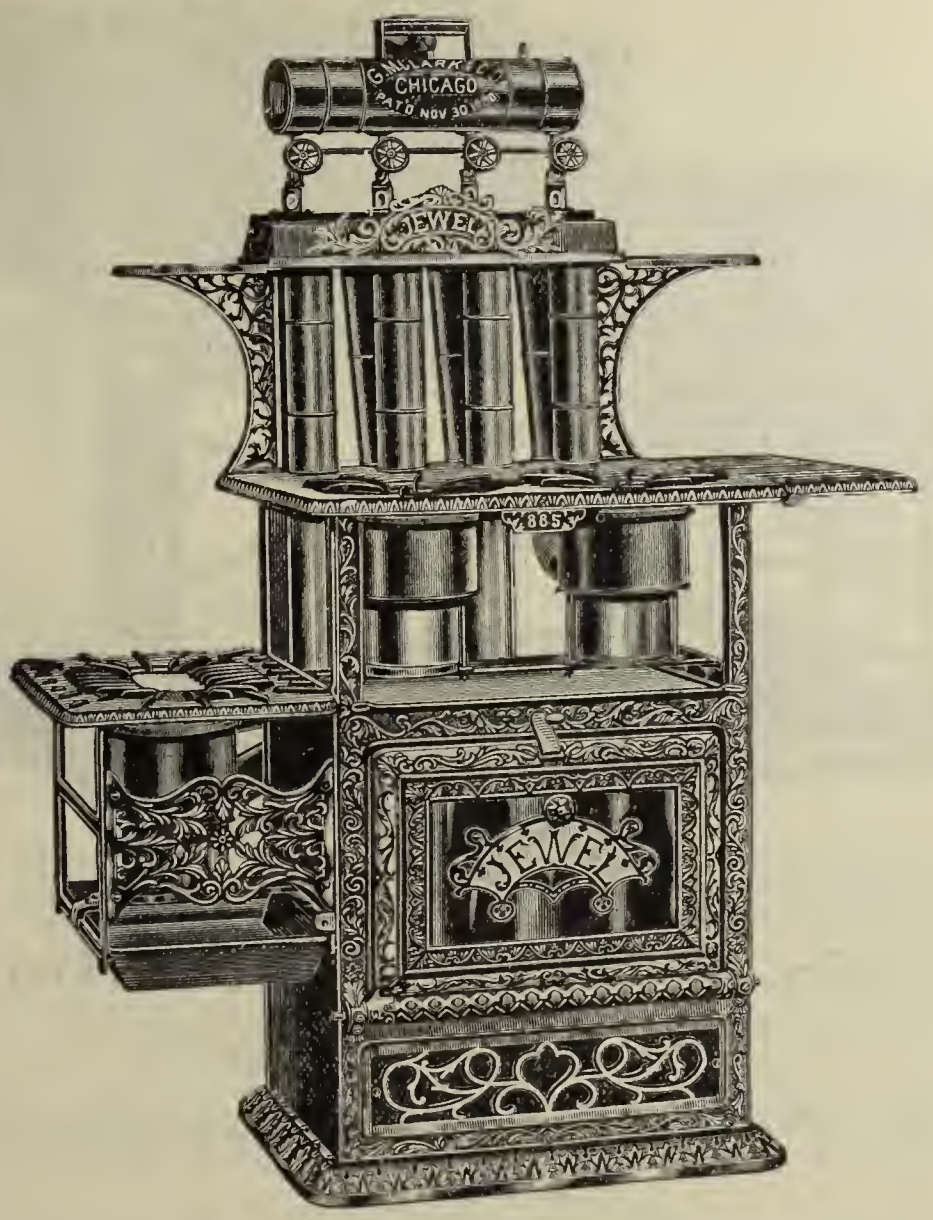
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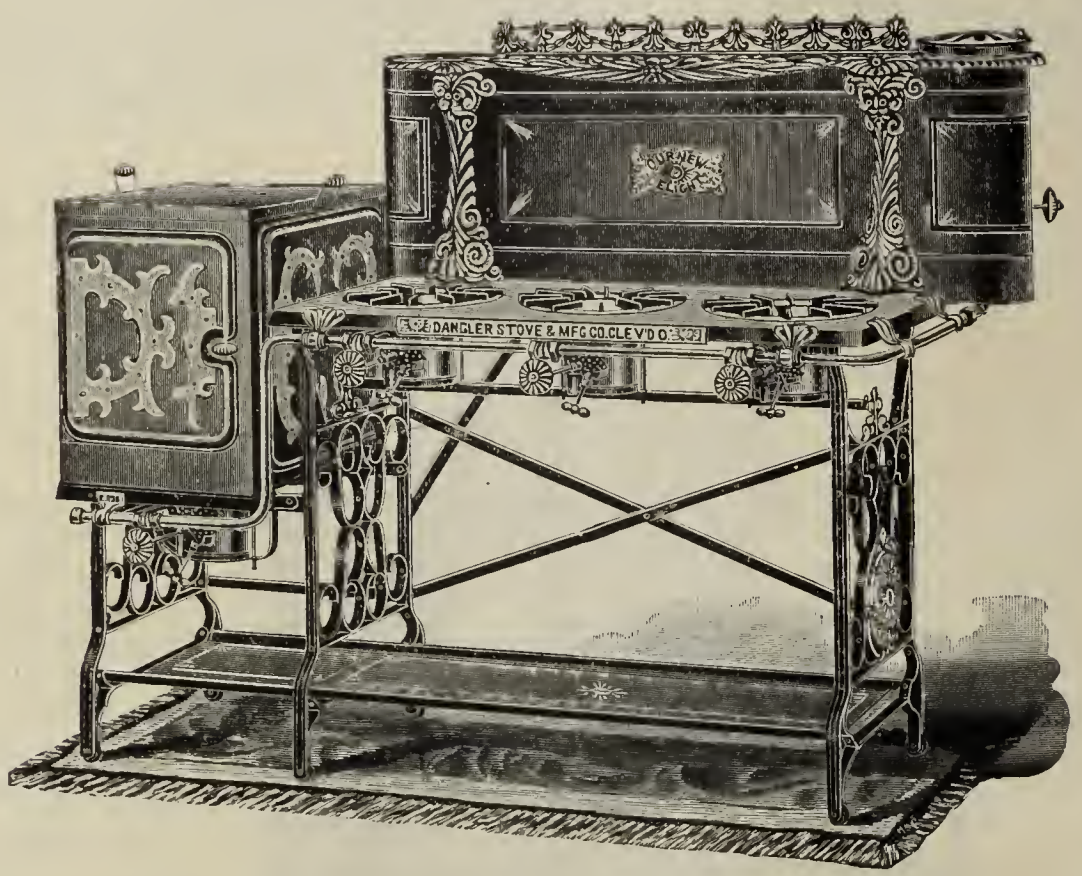
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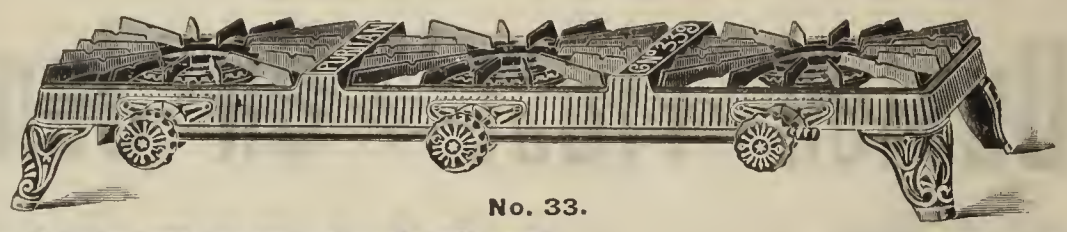
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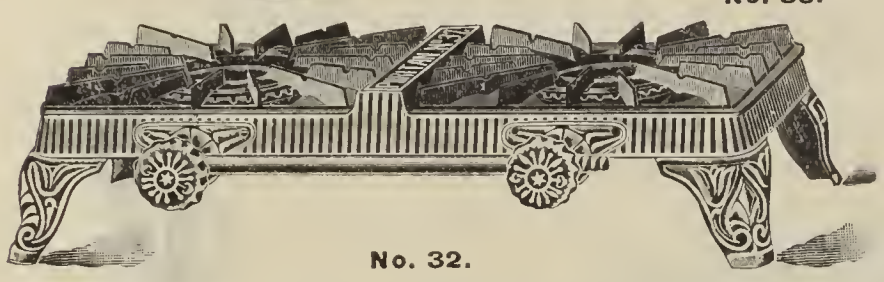
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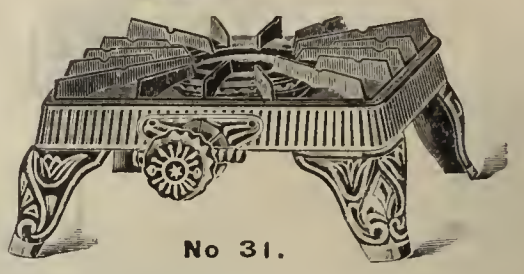
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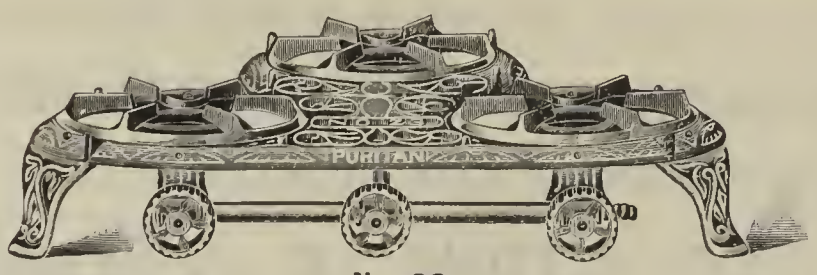
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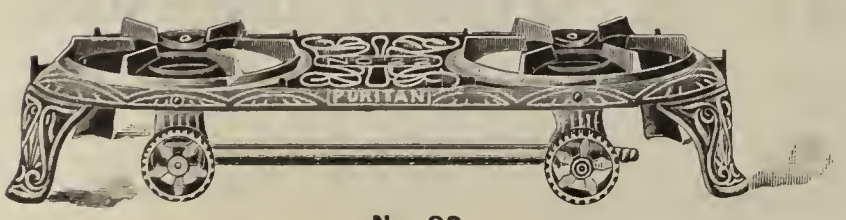
PURITAN, Nos. 41, One Burner
42 Two Burner
43, Three Burner
} BEST AT ANY PRICE

PURITAN, Nos. 31, One Burner
32, Two Burner
33, Three Burner
} BEST FOR THE MONEY.

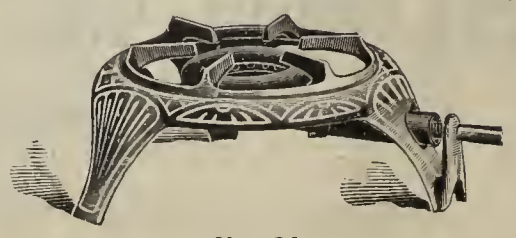
PURITAN, Nos. 21, One Burner
22, Two Burner
23, Three Burner
} BEST FOR THE LEAST MONEY.



No. 23.



No 22.



No. 21.



No. 3 Cooking Range.

"Ladies' Delight" Oil Cooking Ranges

Absolutely Safe. Do not Smoke or Smell. Do not Heat the Oil.

Give more heat and will do more and better cooking than any other.

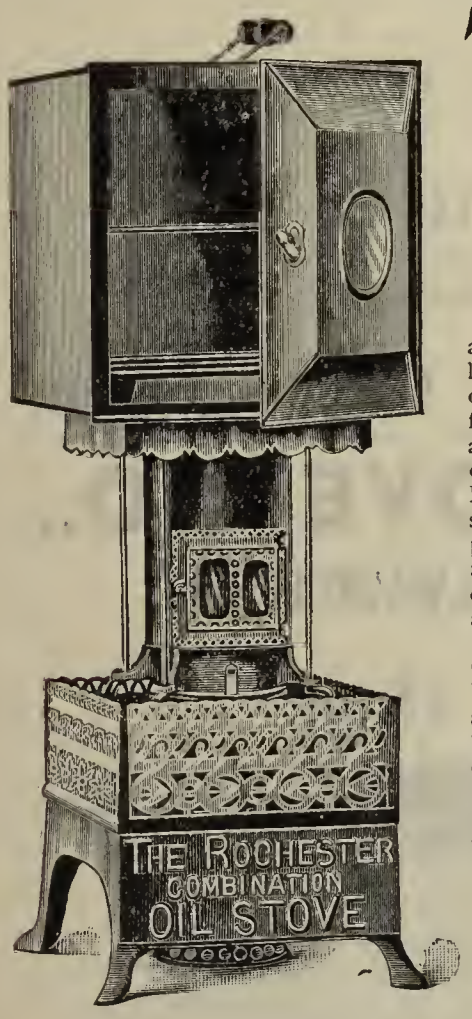
It will pay you to handle them.

Send for Descriptive Circulars.

MANUFACTURED BY

Page Brothers & Co.,

227-233 Cambridge St., Boston, Mass.



The Rochester

(Central Draft)

OIL STOVES.

The Rochester Lamp has long been known as the finest lamp ever made. This is owing largely to its central draft and its perforated cone burner. We have adapted these valuable features to an oil stove. Thus our oil stove is as clean and the combustion as perfect and odorless as the finest drawing-room Rochester Lamp. **THE OIL TANK IS ALL BRASS,** the same as our Mammoth Fount (embossed) in popular Hanging Lamp **This is the only oil stove ever made** with a pure brass Oil Fount or Tank. The Brass Fount or Reservoir holds a full gallon and will burn ten hours, costing only one cent an hour. The Rochester No. 3 Oil Stove (shown in illustration) can be instantly changed from a Parlor Heater to a Cooker and to a Rochester Hanging or Bracket Lamp The stove is **finished in nickel** and is the most ornamental and stylish stove ever put on the market. Price of Stove, complete (but without Heater or Oven), $6 50. Price of Heater (extra), $1.50. Oven (extra), $1.50.

DISCOUNT TO THE TRADE.

ROCHESTER LAMP CO.,

42 Park Place, New York.

BEAUTY OIL STOVES.

Twelve Styles and Sizes.

The only Flat Wick Central Draft Oil Stove made. Send for descriptive catalogue to

F. M. BORDEN & BRO., Philadelphia, Pa.
H. RENDTORFF & CO , Chicago, Ill.
C. T. CORBY, 117 Beekman St., New York.

OR TO THE MANUFACTURERS,

TROY OIL STOVE CO., TROY, N. Y.



THEY SELL EASILY BECAUSE

They have points about which YOU CAN TALK,

Points that never fail to PLEASE BUYERS.

THE GOOD POINTS

Of these Ranges are so good that the buyer at once admits their excellence.

Drop us a postal card and we'll tell you what THESE GOOD POINTS ARE.

CHICAGO & ERIE STOVE CO.,

CHICAGO, ILL. ERIE, PA.

Luther & Lederhos,

MANUFACTURERS OF



Gas and Oil Stoves,

30 Cliff St., N. Y.

Write for Catalogue and Prices.

– PARKER: "I have received very gratifying news of my son who recently went to college."

Barker: "Yes? What news?"

Parker: "He's alive."—*Puck.*

— "AND so, Mrs. de Gollver, your poor boy was killed by savages?"

"Ah, yes!"

"South Africa?"

"No—college."—*Cleveland Plaindealer.*

— VISITOR: "I've just come from Niagara Falls."

Ardent Chicagoan: "Great guns! Has that been running during the World's Fair?"—*Chicago Record.*

E. BEMENT & SONS'



Palace Regal.

The extraordinary success of this stove is due to the fact that it exposes the hot air and products of combustion for a longer time to a greater radiating surface than any other stove ever made.

E. Bement & Sons,

Stove Makers,

Lansing, Mich.

MILWAUKEE GAS STOVE CO.,

OFFICE AND WORKS: 15 and 17 Erie Street, - MILWAUKEE, WIS.

OUR LEADER FOR 1894.

Features.

Adjustable valves.
Superior in design.
Excellent in workmanship.
Cleaning burner attachment.
Great efficiency in doing work.
Extreme economy in gas consumption.

The drop door, unlike those on other ranges, is entirely new, simple and durable.

OUR CATALOGUE AND DISCOUNT SHEET ON REQUEST.



Our Goods are Superior in Quality of Material used and in Workmanship.

WILL MEET THE DEMAND.

We offer this line on its merits, coupled with the fact that its price is about one-quarter below any gas range heretofore offered by us.

We carry a full line of Heaters and Gas Grates.

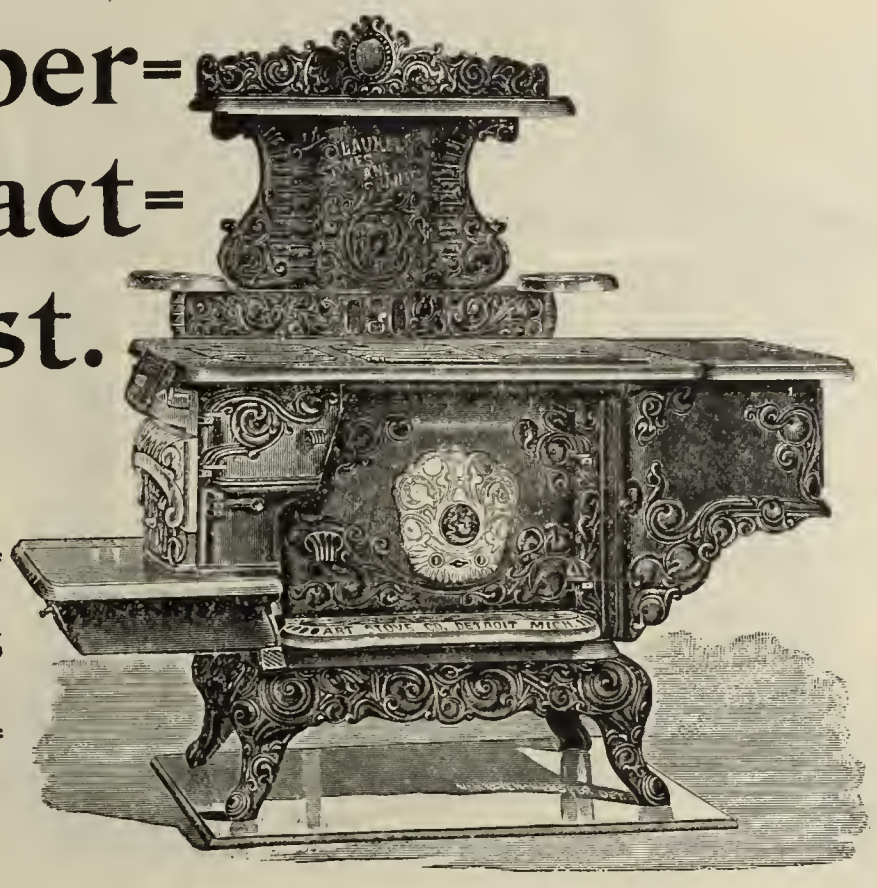
Manufacturers of
Gas Stoves and Ranges,
Fire Places and Heaters
Laundry Heaters,
Hatters' Iron Heaters,
Ovens, Hotel Ranges,
Kilns for Firing China,
Kilns for Firing Glass,
Melting Furnaces,
Coffee Roasters,
Soldering Furnaces,
Bakers and Broilers.

SALESROOMS AND WAREHOUSES, { NEW YORK CITY, N. Y., AND CHICAGO, ILL.

SALESROOMS ONLY, { SAN FRANCISCO, CAL., AND PORTLAND, OREGON.

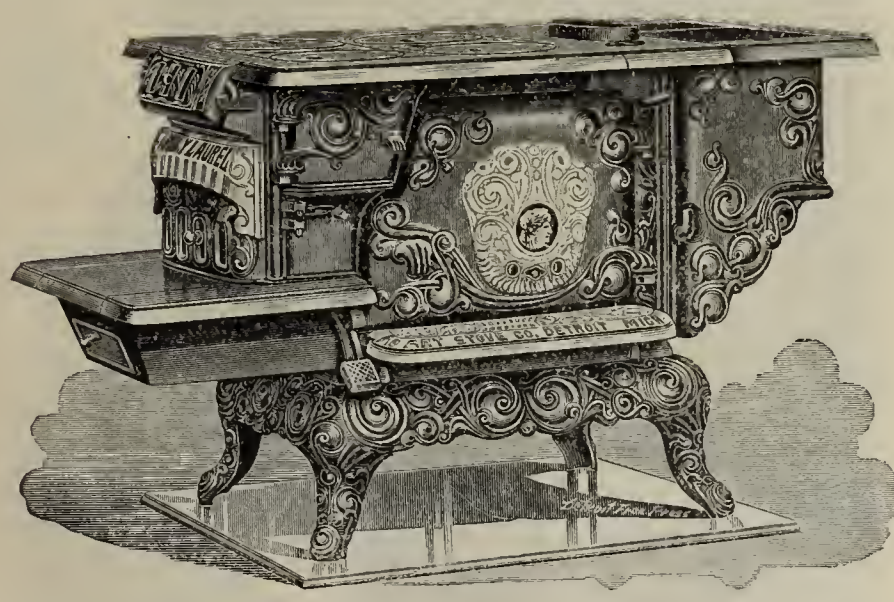
Entirely New Line.

We are operating our factory full blast.



The most remarkable line of Stoves and Ranges yet introduced.

Full line of sizes for coal and wood. Large square ovens. Numerous improvements. Beautiful design. A strictly high grade line at reasonable price.



It will pay you to write us for prices and discount.

ART STOVE CO.,

DETROIT, = = = MICH.



Latest and Best.

THE

Warren Steel Range

Is made of the best quality cold rolled sheet steel. Flues lined with asbestos, protected by sheet steel, retaining all the heat in the Range Very economical in fuel. Extra heavy sectional cast fire linings or brick. Oven so bolted and braced that it cannot warp. Five sizes for family use, and two with double oven and end fire boxes for hotels, etc.

An enterprising dealer in every town should have them in stock.

In style, finish and mechanical construction they are the finest Range in the world. Made in right and left hand

Write us at once for our elegant new catalogue, and see the extremely low prices for this high grade Range.

MANUFACTURED BY

The Warren Hardware Co.

7 Market Street,

WARREN, - OHIO.

Famous Magnet Wood Furnace

SIMPLE, STRONG,

Moderate in Price.

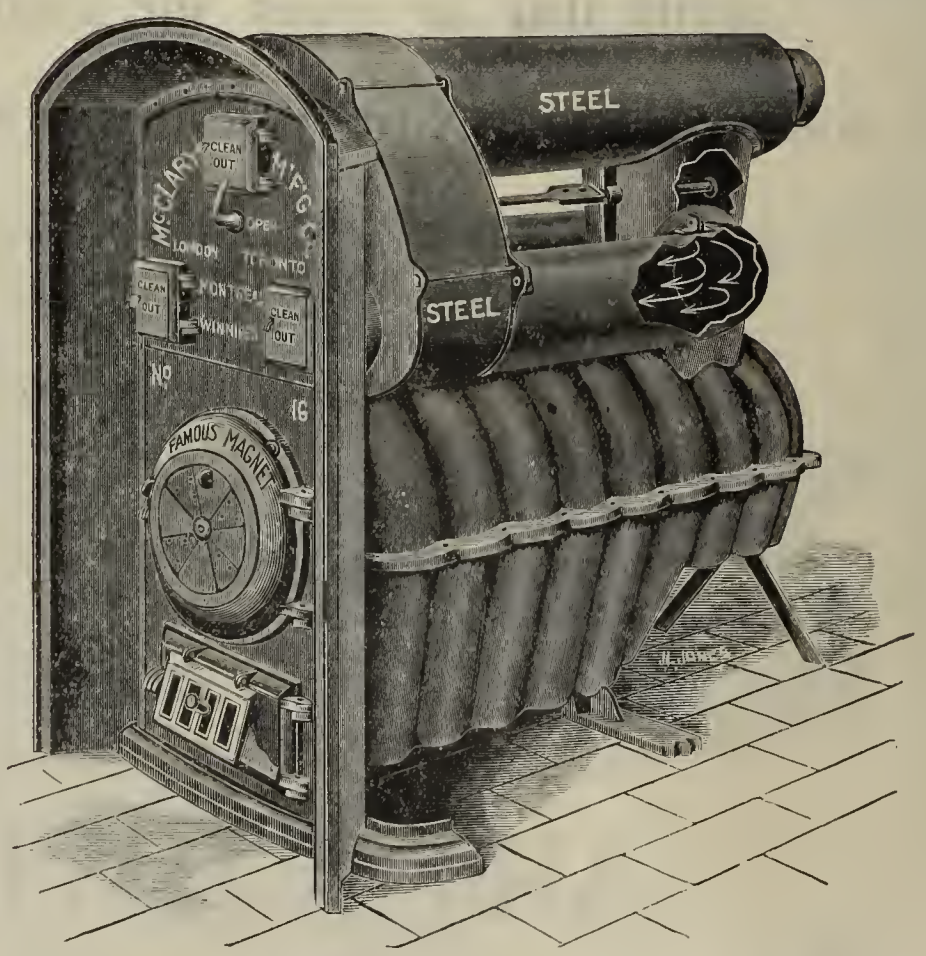
THREE SIZES

No. 14—Length of fire box 33 inches
No. 16— " " 50 "
No. 17— " " 60 "

Portable or Brick Set.

We are prepared to sell these at prices which will pay to import them into the United States.

We are also prepared to negotiate with manufacturers for sale of a set Duplicate Patterns.



NEW

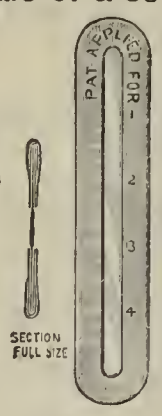
Pat. Mica Creamer Gauge,

JUST OUT.

Patent Applied for in Canada and U. S.

Creamer Trimmings, &c.

WRITE FOR PRICES.



McCLARY MANUF'G CO'Y,

LONDON, TORONTO, MONTREAL, WINNIPEG and VANCOUVER, B.C.

The Largest Manufacturers of Stoves, Tinware and Tinsmiths' Supplies in British North America.

MENTION THIS PAPER.

Gem=Climax

FOR COAL OR WOOD



Ranges

made in all the various styles and sizes. The Flattering Success of the Gem-Climax medium priced, four hole range is in keeping with all the

Climax Stoves and Ranges.

SEND FOR CATALOG.

TAPLIN, RICE & CO., AKRON, OHIO.

FERROSTEEL RANGES

Originality	ARE GOOD SELLERS BECAUSE OF THEIR . .	Style and Finish . .
Material		Economy . . . . .
Construction . . .	* * * WRITE FOR CATALOGUE * *	of Fuel . . . . .
Perfect Operation . .	THE DIPPO MANUFACTURING COMPANY, Chagrin Falls, Ohio.	Low Priced . . . .

A CONTINUAL PROCESSION OF



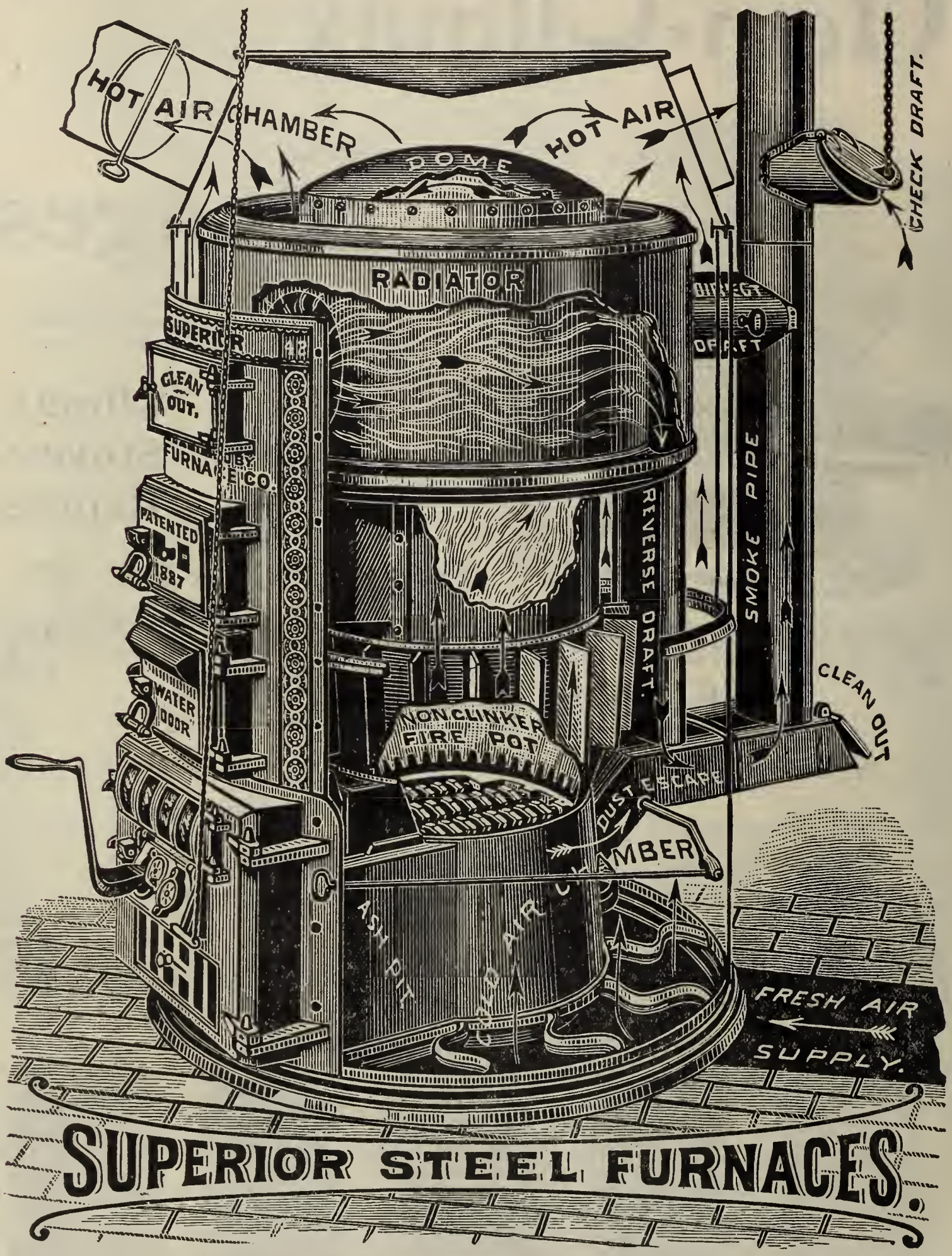
PARAGON. FIDELITY. PARAGON. FIDELITY. PARAGON.

PARAGON FURNACES and FIDELITY RANGES

Is moving steadily from our works to the homes of delighted purchasers, by way of the stores of enterprising dealers, who have found profit in aiding the course of the procession. You can get into line if you will.

Isaac A. Sheppard & Co, Manufacturers, 1801 N. Fourth St., Philadelphia, Pa.

BUY THE BEST.



SUPERIOR STEEL FURNACES.

IMPROVEMENT THE ORDER OF THE AGE

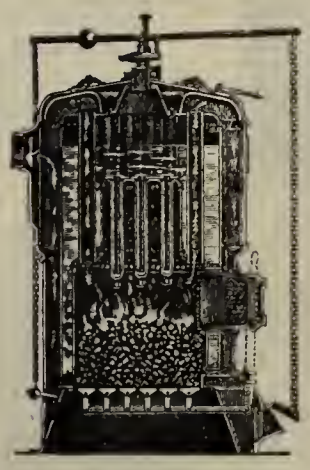
is nowhere better exemplified than in the construction and workings of the Superior Line of Furnaces and Heaters. Nothing complicated. Everything about them on the common sense principle. DESERVEDLY POPULAR AND EMINENTLY SUCCESSFUL WHEREVER INTRODUCED.

Practical Agents wanted in every City. Correspondence Solicited.

MANUFACTURED BY

SUPERIOR FURNACE CO., Little Falls, N. Y.

WHO TRIED TO BLOT US OUT?



HA. — HA. THIS WE ARE HAPPY TO SAY CANNOT BE DONE, AS THE SUN HAS COME TO STAY, AND ITS FAME. CANNOT BE OBLITERATED BY THE PETTY ATTACKS OF ITS COMPETITORS:

"THE SUN" DO MOVE.

THIS MAY NOT BE THE CASE, WITH THE CELESTIAL ORB, YET IT IS TRULY THE CASE WITH THE "LINDEMUTH" SUN STEAM AND HOT WATER BOILERS. THE GREAT DEMAND THAT HAS BEEN CREATED, CERTAINLY MAKES THIS BOILER MOVE RAPIDLY. THIS AS A SENTENCE WE CAN ILLUSTRATE TO YOU VERY CLEARLY, IF YOU WRITE TO US FOR OUR CATALOGUE GIVING TESTIMONIALS, REFERENCES, ETC, AND YOU WILL BE STILL MORE CONVINCED IF YOU MAKE APPLICATION FOR THE AGENCY, AND USE THEM IN YOUR WORK, AS THEY CERTAINLY DO.

THE SUN BOILER IS BUILT FROM THE MOST CAREFULLY SELECTED STEEL PLATE, BY THE BEST WORKMAN-SHIP, ON THE MOST SCIENTIFIC PRINCIPALS, INSURING THEREBY THE GREATEST ECONOMY IN FUEL, AND READINESS OF HOT WATER WITH THE LEAST AMOUNT OF ATTENTION, AND THE GREATEST EASE OF MANAGEMENT.



CONSIDERING THE QUALITY OF THE BOILER, OUR PRICES ARE SUCH AS WILL MEET COMPETITION, THEREFORE WE SOLICIT YOUR APPLICATION FOR PRICES, DISCOUNTS, AND CATALOGUE.

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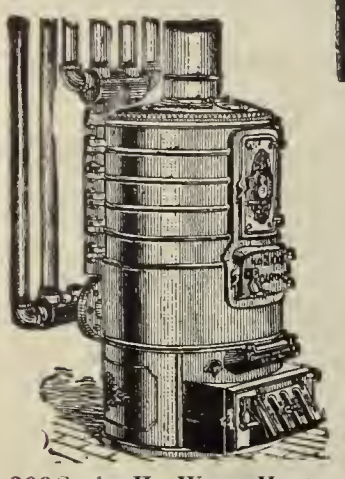
THE RAYMOND AND CAMPBELL MFG CO.

MAIN OFFICE AND WORKS	MIDDLETOWN, PA.
NEW YORK STORE AND WAREHOUSE	#244 WATER ST.
BOSTON AGENCY	#4 OLIVER ST.
PHILADELPHIA AGENCY	#45 N. SEVENTH ST.
CLEVELAND AGENCY	#1463 WILLSON AVE.
WASHINGTON AGENCY	#1297 NINTH ST. N.W.

HEATERS EMBODY:
Efficiency,
Economy,
Durability
and
Best Construction.

Gurney

RADIATORS EMBODY:
Positive Circulation,
Full Measurements,
Small Water Volume,
Artistic Design
and Proportions,
and require only
small space.



300 Series Hot Water Heater

Hot Water Heaters and Radiators.

"ABSOLUTELY THE BEST."

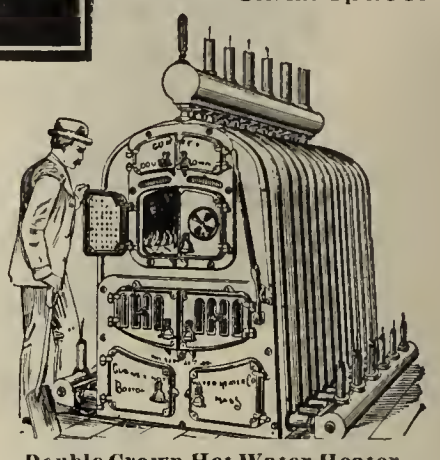
The phenomenal success attained by them fully verifies this claim.

ADDITIONAL NEW LINES FOR THIS SEASON'S TRADE.

—SEND FOR TRADE CATALOGUE.—

GURNEY HOT WATER HEATER CO.,
163 Franklin St., Boston, Mass.

SELLING AGENCIES: { Johnson & Co., 71 John St., New York.
{ J. C. F. Trachsel, 246 Arch St., Philadelphia, Pa.



Double Crown Hot Water Heater.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET, - - - - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**



ARE UNSURPASSED.
THOUSANDS IN USE.
For References and Information apply to
M. MAHONY,
Troy Architectural Iron Works,
TROY, N. Y.



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and Showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

THE VOLUNTEER

STEAM.



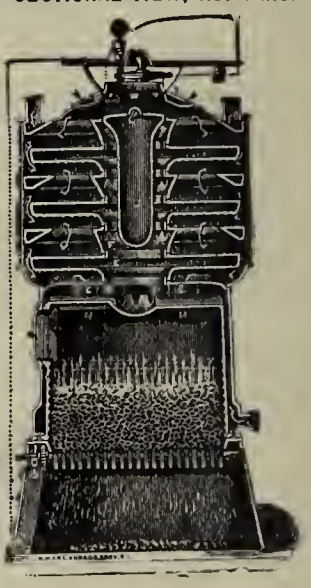
For hot water or steam has no superior, and is the only hot water boiler that is **SELF REGULATING.**

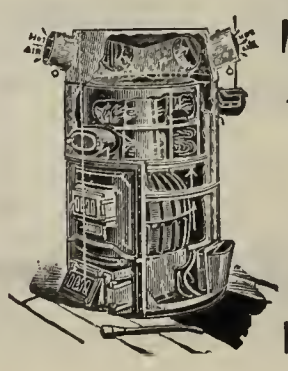
Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

These boilers have a large sale in New England.

SECTIONAL VIEW, Hot Water





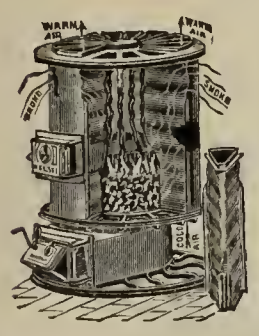
The Boomer is a Success.

Guess which is one of the Leading Furnaces offered for sale to-day.

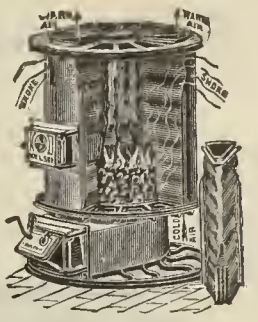
Write for Catalogue, which explains all about the Boomer.

HESS, SNYDER & CO., MANUFACTURERS. Massillon, Ohio.

— "I AM NOW," croaked the parrot, reaching for its mistress' costly bonnet, "about to put in a bill for damages."—*Chicago Tribune.*



KELSEY



FURNACE COMPANY,

MANUFACTURERS OF THE CELEBRATED

Kelsey Corrugated Warm Air Furnace,

SYRACUSE, N. Y.

If you are looking for a reliable Furnace to handle, read the following:

BOWERS, GALPIN & CO.,

"HEATING & PLUMBING DEPT"

BINGHAMTON, N. Y. March 16 1894

Kelsey Furnace Co

Gentlemen

Answering yours 13 inst briefly, in the order asked.

Both Thompson and Crandall are pleased, and every body having the Furnace this year and other years before, give us splendid reports

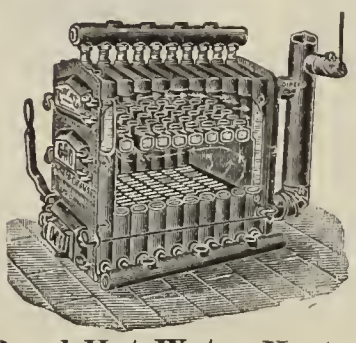
- All seem to be happy
- We of course delighted
- The future outlook excellent
- Not a break - crack - warp or defect. not a Furnace taken out or a dissatisfied purchaser to our knowledge in three years

Yours truly

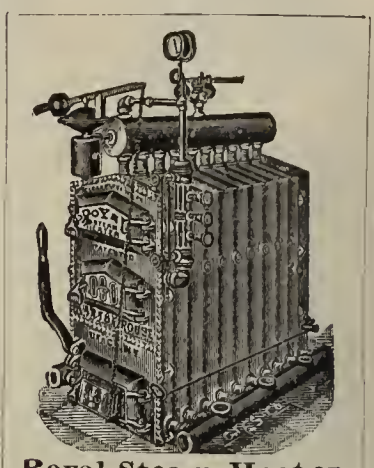
Bowers Galpin & Co

Sold on their Merits,

and not on their Antiquity.



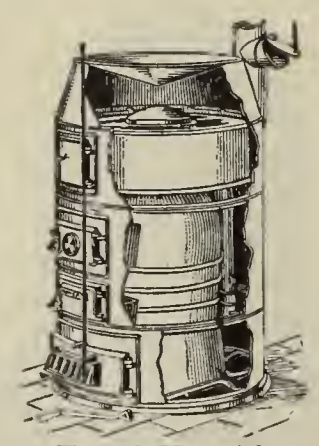
Royal Hot Water Heater.



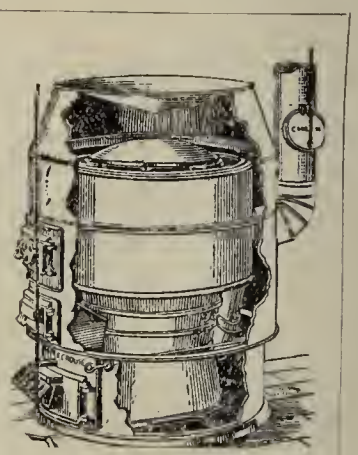
Royal Steam Heater.



Imperial Hot Air Furnace.

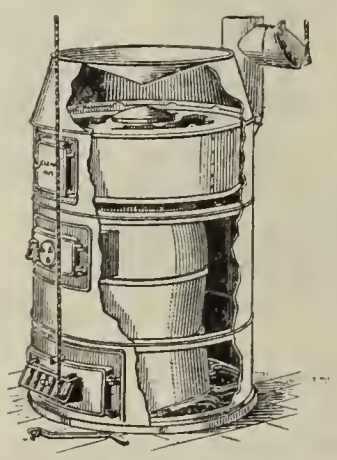


Royal Hot Air Furnace.

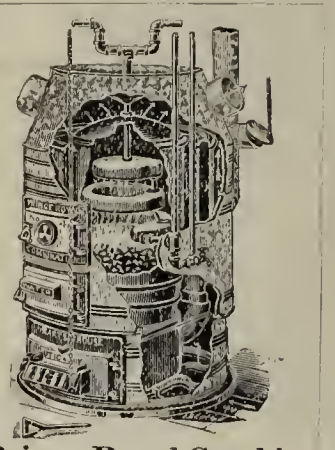


Prince Royal Hot Air Furnace.

ROYAL HEATERS



Royal Victor Hot Air Furnace.



Prince Royal Combination Heater.

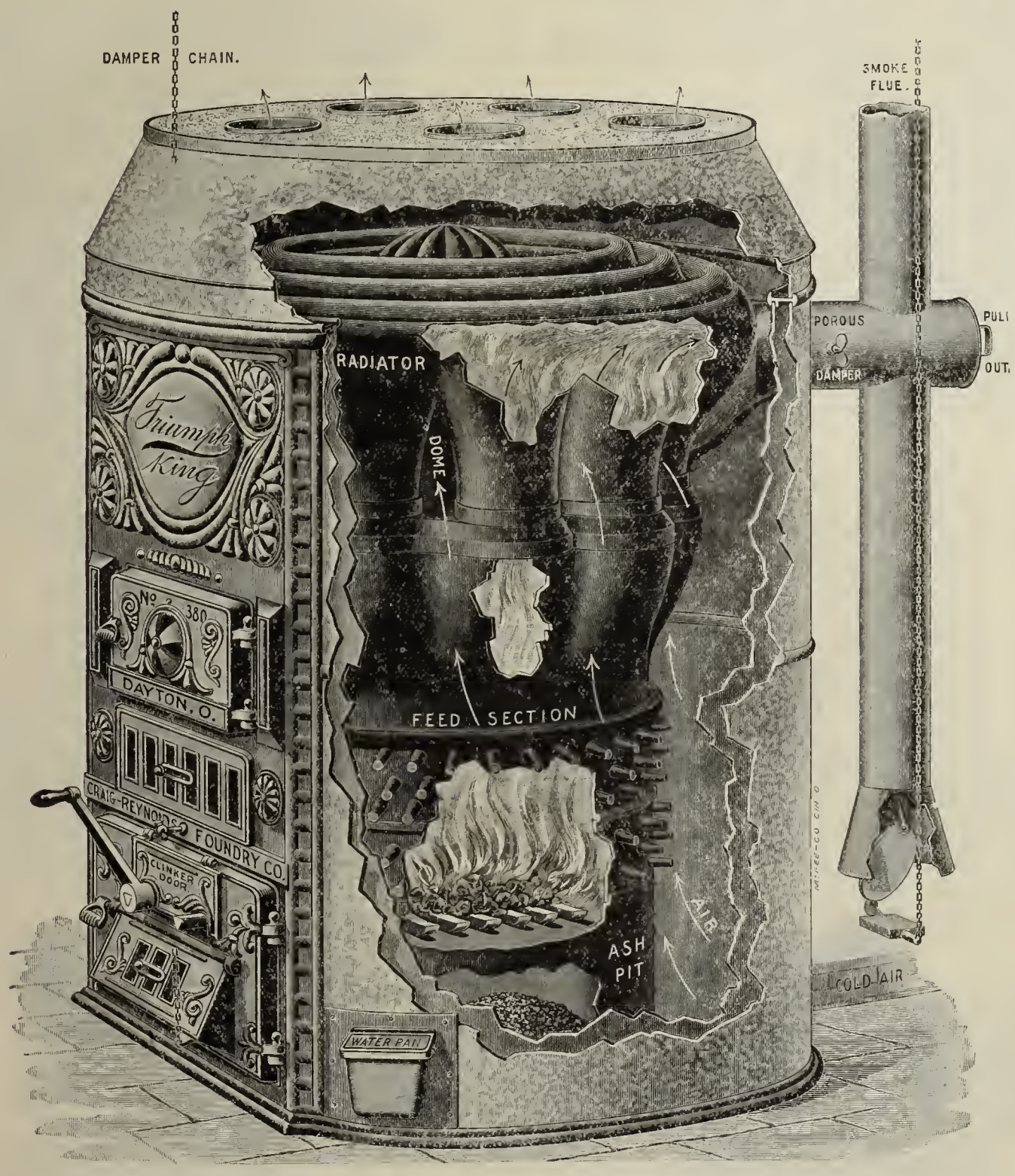
Hart & Crouse,

No. 1 Cornelia Street, UTICA, N. Y.

CHICAGO, 113 LAKE STREET.

W. M. MACKAY, Manager Hot Water and Steam Dept., No. 236 Water St., New York.

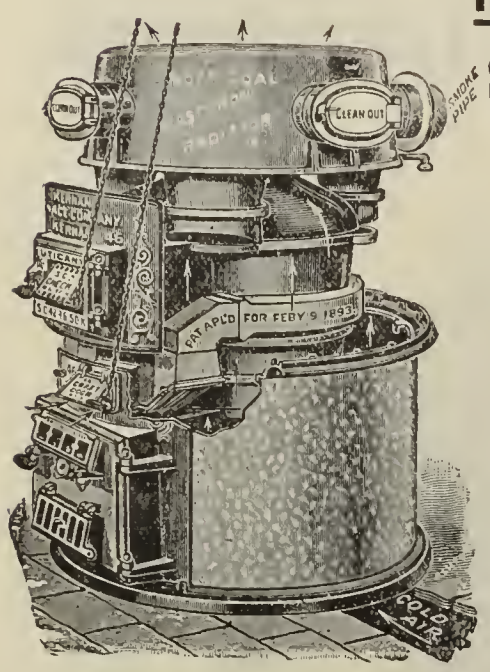
Triumph Furnaces



Are all that can be claimed for A GOOD FURNACE, *with sectional porcupine fire pot, so that Anti-Clinker Grate is easily removed when desired, Improved Dust Damper and a host of other features so good, so practical, that no other furnace can compare with them in point of durability, economy and cheapness. Territory now open. Write quick for agency.*

The Craig=Reynolds Foundry Co., Dayton, O.

KERNAN



New Process

Smokeless

Soft Coal

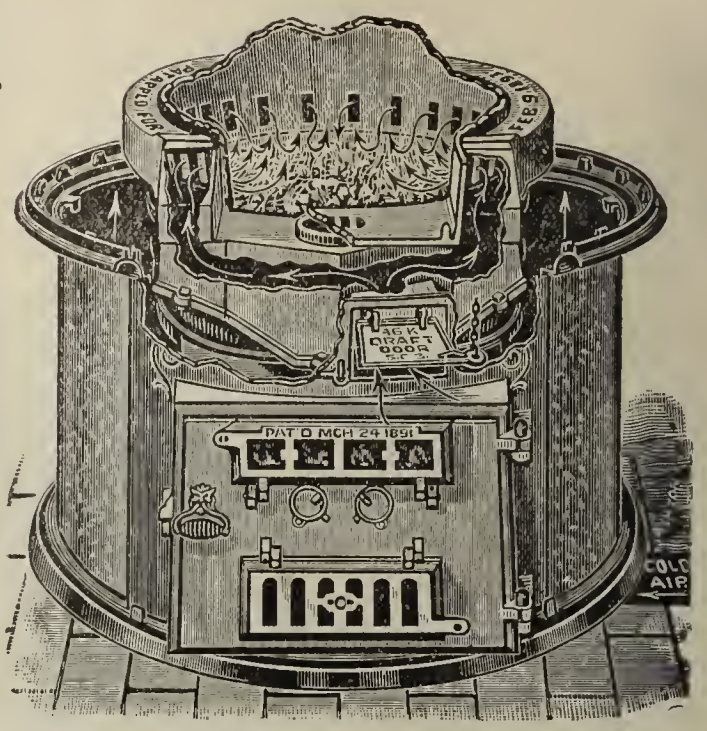
Cast Iron

Furnace.

—o—

NO

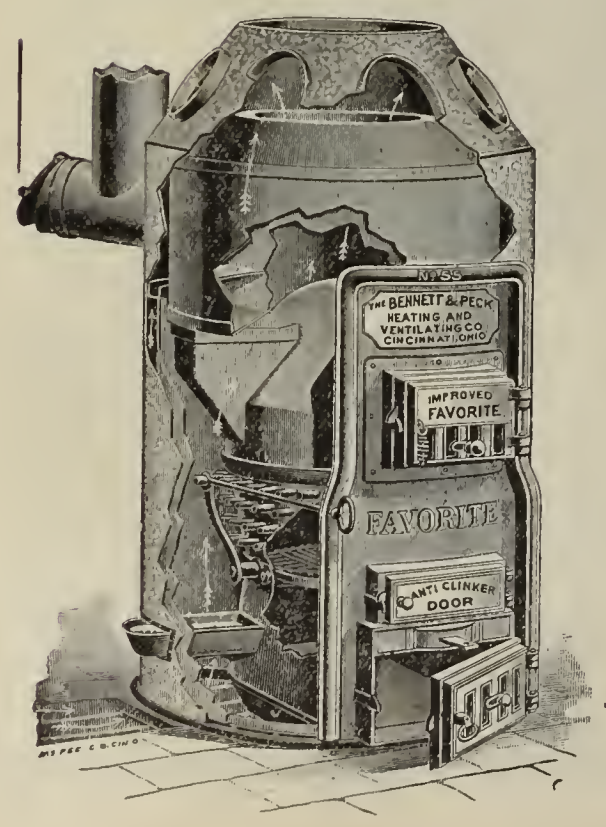
EXPERIMENT.



KERNAN FURNACE COMPANY,

CHICAGO, ILL. UTICA, N. Y.

Millions

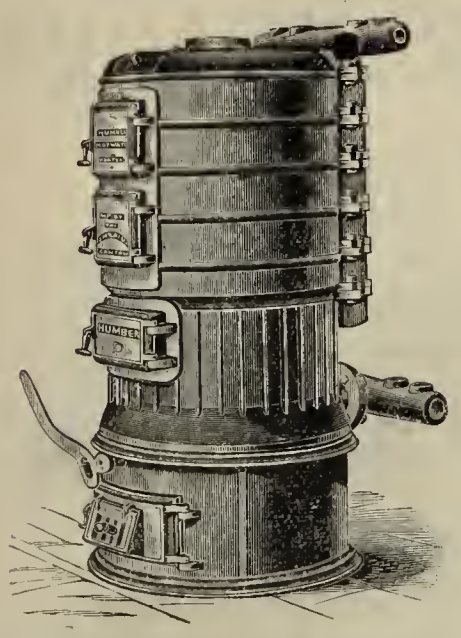


of cubic feet of pure fresh warm air are being supplied daily by our various Heating Apparatus all over the U. S., and not a single complaint. Why? The reason is self evident: our system and principles involved are as near perfection as the best skill and mechanical ability could possibly make them.

Any dealer can handle our Favorite Furnace to better advantage, both in point of profit and satisfaction resulting, than any other. We invite all not handling it, to secure the agency before it is too late.

The Bennett & Peck Heating & Vent'g Co.,

Cincinnati, O.



HUMBER
HOT WATER HEATER.

20 SIZES. For HARD and SOFT COAL.

Perfect in Construction. *Economical in Use.*

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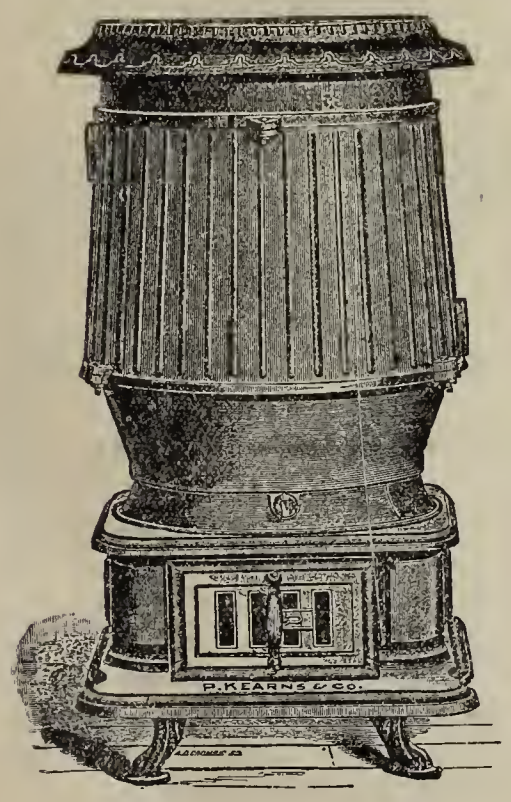
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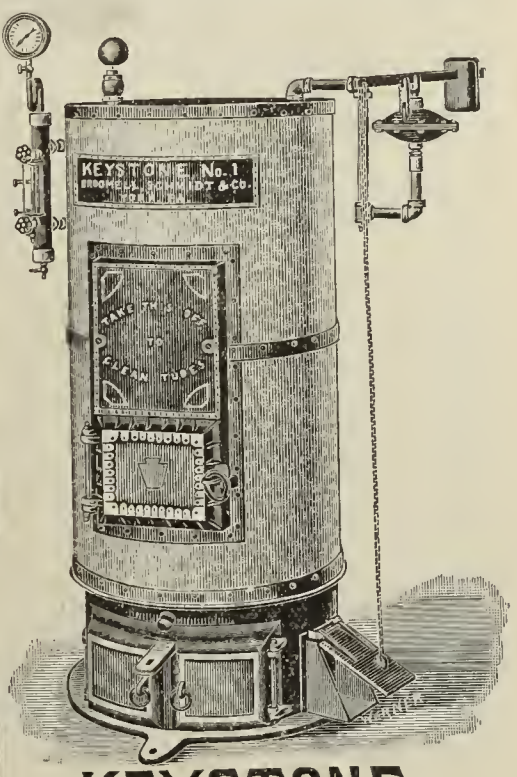
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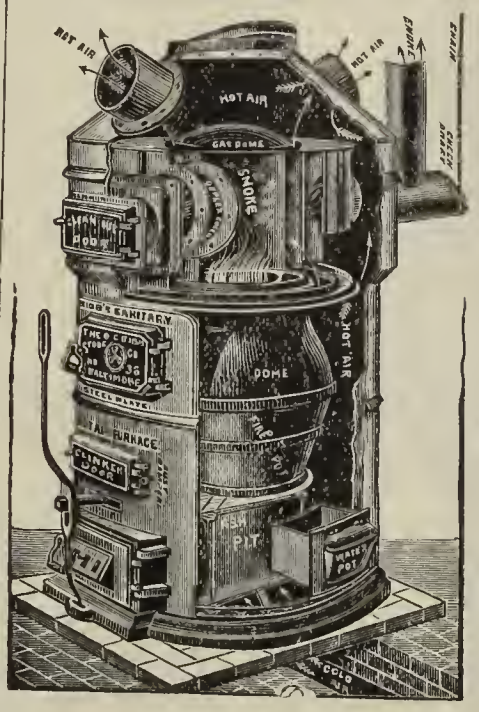
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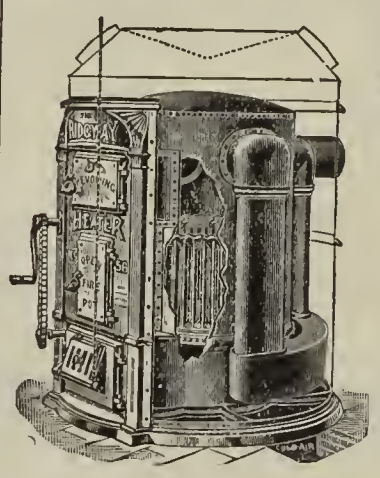
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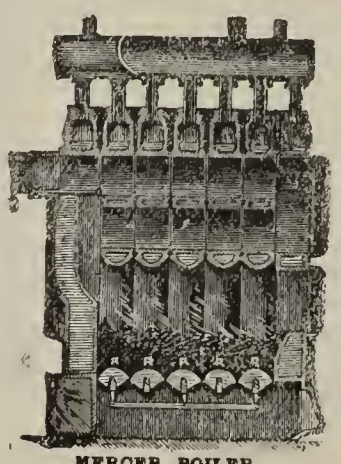
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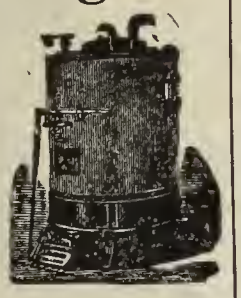


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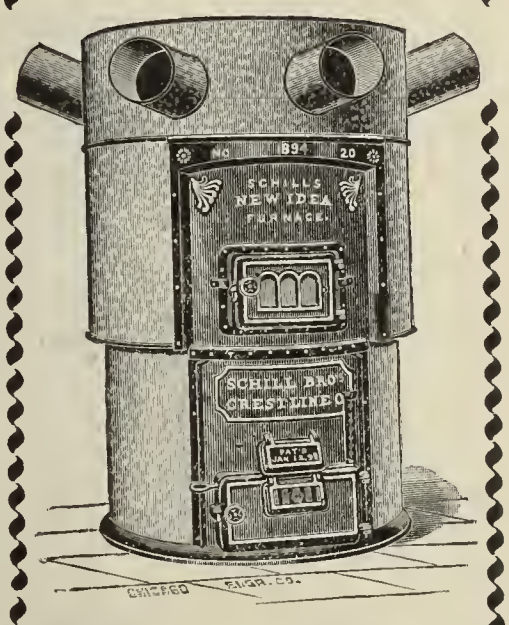
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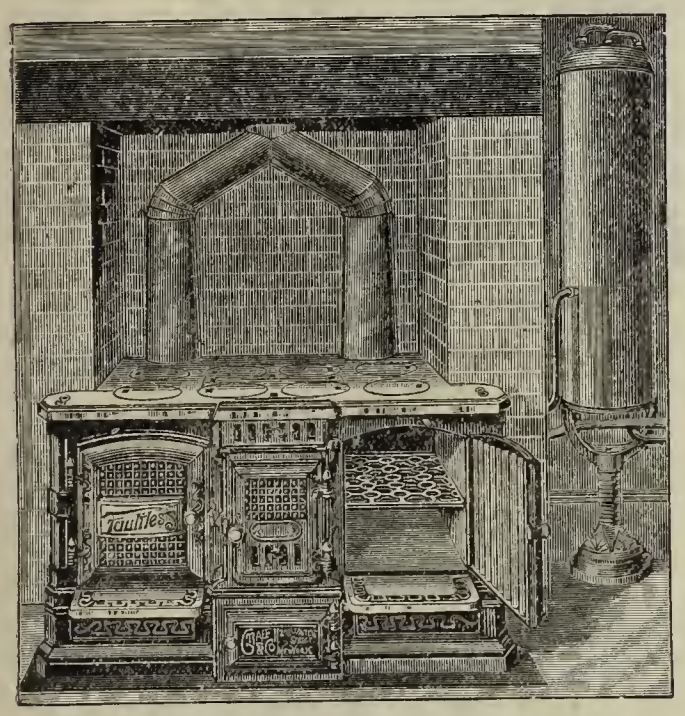
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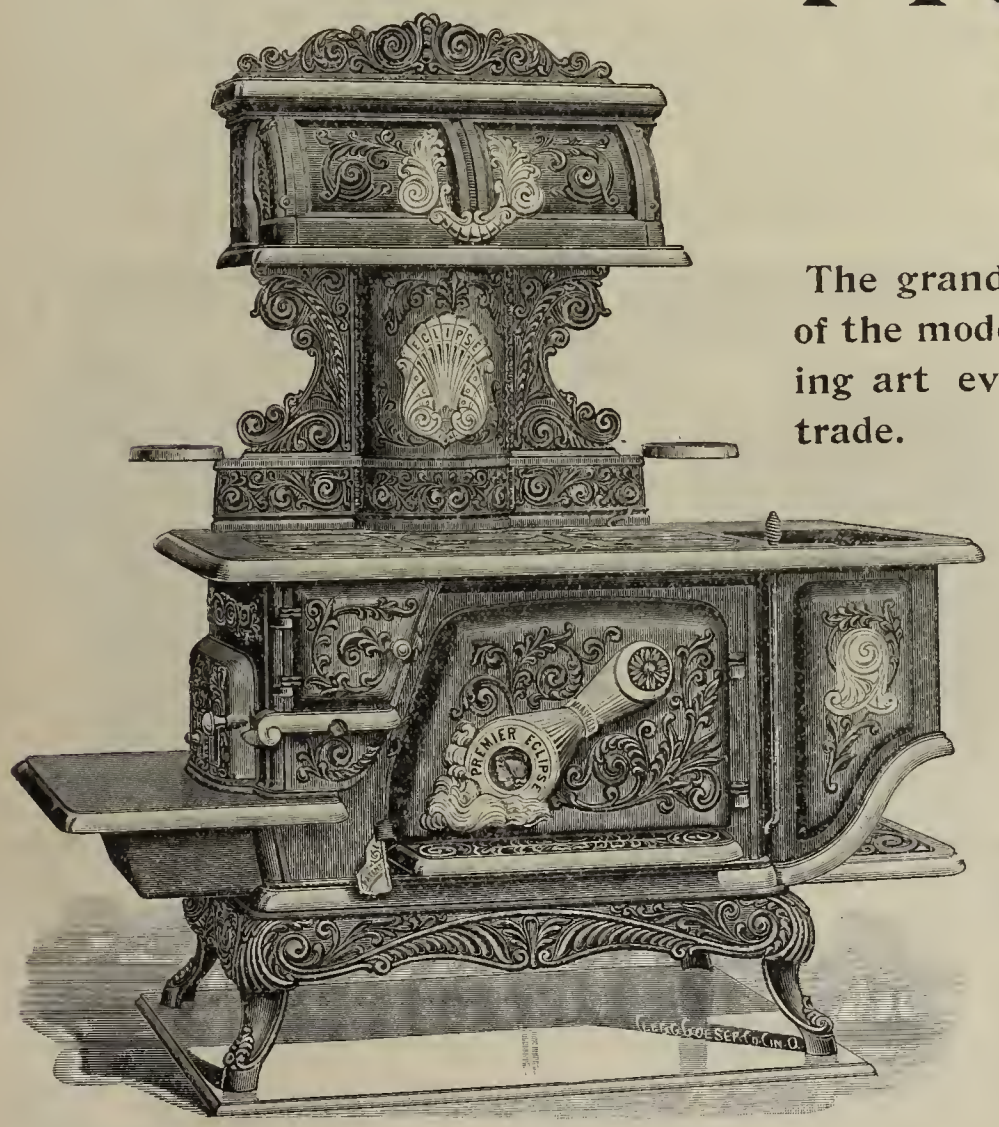
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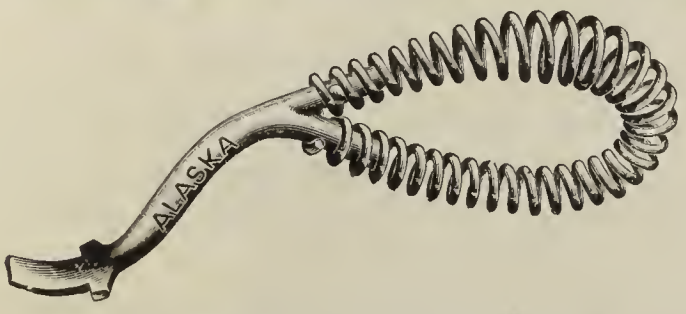
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— THE OTHER TRAVELER KNEW THE TOWN.—I arrived in a small town in Kentucky late at night with three other men, and when we reached the hotel two of us were assigned to a room. The one I got had two beds in it, however, and I was not disposed to find fault. My roommate seemed to be a suspicious sort of chap, and when I tumbled into bed with a "good-night" to him he scarcely deigned to reply. I was asleep in ten minutes, but two hours later I awoke to find him still sitting in his chair and wide awake.

"Hello! What ails you?" I asked.

"Nothing."

"Troubled with insomnia?"

"No."

"Sleep all day?"

"No."

"Afraid of me?"

"To be honest with you, stranger, I am," he admitted.

"That seems funny. Do I look like a thief?"

"No, you don't; but I have done some figuring in this. You gave the landlord your wallet and watch, didn't you?"

"Yes."

"Well, there's more value than he has probably ever seen before. He'll skip with your stuff before daylight."

"Well?"

"And then you'll have to rob me to get on. Stranger, I'm a man as never takes no chances. I've got a revolver here, and the first move you make to get out of bed I'll plug you."

"I can turn over, can't I?"

"Yes, but be powerful careful about it, for I'm up to snuff."

I turned over and went to sleep again, and when morning came his moving around awoke me. I tried to joke him, but he was sour and morose and wouldn't take it. When we went downstairs it was to find the colored help sitting in the early sun with no move toward breakfast.

"What's the matter?" I asked.

"Mars ——— has done gone an' lef de place in de night, an' dar's nobody to boss!" was the reply.

My roommate had figured "right smart."
—*Louisville Courier-Journal.*

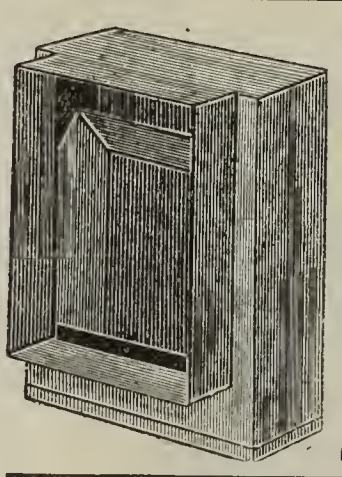
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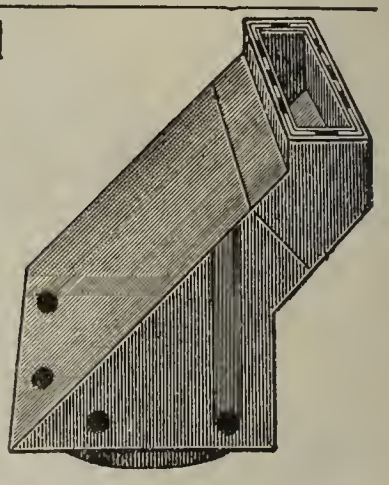
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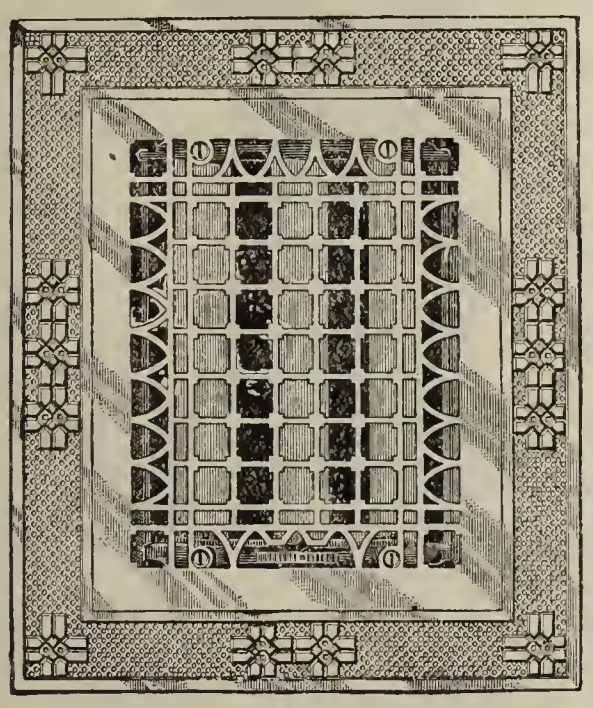
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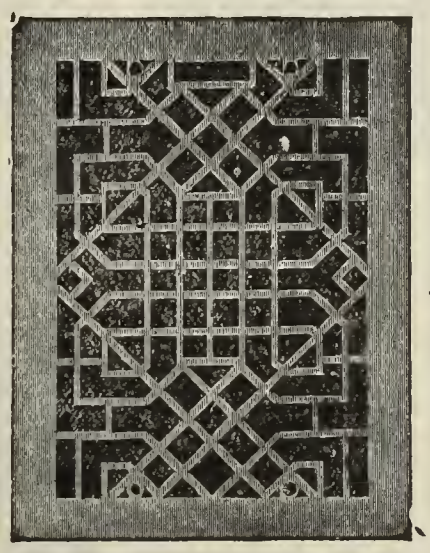
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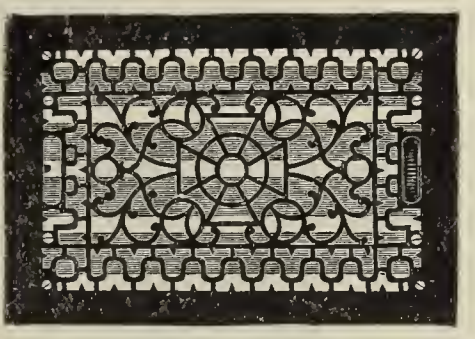


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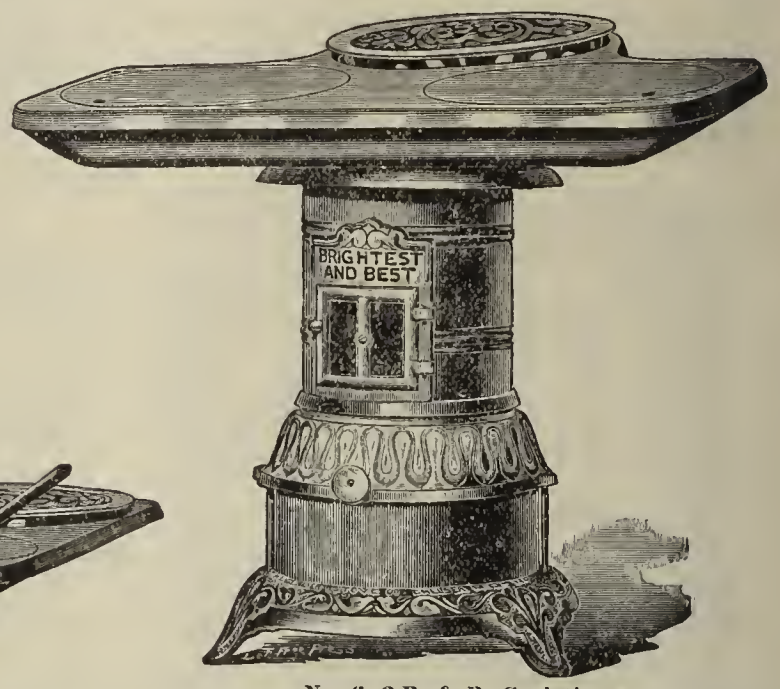
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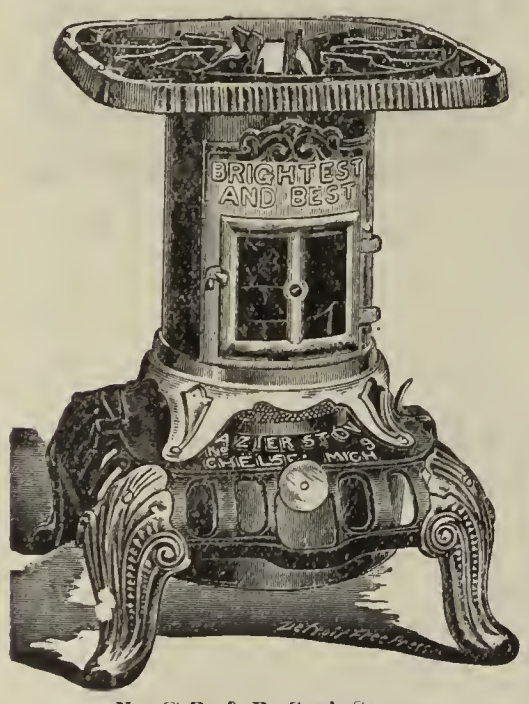


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THE METAL WORKER.

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Galvanized Sheet Iron.

We commend to the attention of those of our readers who are interested in buying and selling galvanized sheet iron a table of net prices published upon another page of this issue. It is known that the standard gauge for sheet iron was changed last year by act of Congress, and on the first of last July the revision came into effect. The new gauges are based on weights per square foot in ounces avoirdupois, varying by even or half ounces. Galvanized sheet iron is likewise gauged by weight, the black iron gauge being used as a basis and 2½ ounces per square foot added for the corresponding galvanized sheet iron numbers. In the list presented elsewhere the discounts range from 65 per cent., which is below present prices, to 85 per cent., which is much above the present discount. The table covers all the gauges in common use —that is, starting with 10, 12, 14, 16 and 18, then by single numbers to and including No. 30. Referring to the page containing this table, it will be noticed that the top line gives the list price per pound, then ounces per square foot, next the decimal equivalents in pounds per square foot, and the fourth line, in heavier type, is the list price per square foot. Below are given the discounts, the prices being in cents. For each discount net prices are worked out per pound and per square foot for all the above mentioned gauge numbers. To facilitate reference heavy faced type is used for the per square foot discounts. Twenty-five discounts are given in all, so there are prices for variations of less than 1 per cent. in the discount.

Evening Classes.

As the season of evening class instruction draws to a close there must come to many a young man who has profited by it a clearer realization of his opportunity in life. He will see that what he is and what he may be depends almost entirely upon his own exertions. He appreciates more fully than ever before not only the pleasure of possessing knowledge, but perhaps even now has learned how it profiteth a man to be wise. But a man can no more acquire knowledge by a mere receptive process without exertion of his own than he can gain strength without exercise. Thanks to the generosity and the foresight of individuals and various organizations, there can now be obtained in almost any town or city of moderate size evening class instruction in at least the rudiments of an education, and that without expense to the pupil, while in the larger cities free courses may be attended in drawing, the higher mathematics, manual training and designing, and such other instruction may be obtained as will thoroughly equip an ordinary mechanic for a responsible position. Doubtless many a draftsman or head designer can trace his progress back to a humble beginning in an evening drawing class. But even this general instruction is being supplemented by more detailed courses in certain departments, either in day or evening classes. Such, for instance, is the proposed course in sheet metal pattern cutting at the Pratt Institute, Brooklyn, of special interest to the readers of this paper, in which it has already been announced. To a young man who has his evenings to himself there can be no reasonable excuse if he lacks a fair rudimentary education. It all depends upon his own determination and persistency.

Self-Education.

Even to the young man deprived of the advantages of evening class instruction there is still an opportunity to perfect himself by home study. True it is that such study is difficult, progress is far less rapid and there is much more excuse for failure than is the case when the student is subject to the encouraging influence of others studying with him under competent iustruction. But on the other haud, once mastered, the subject is his by right of conquest who wins single handed. It is impressed on his mind as it could never be had the struggle been less severe. Success in home study is, to a large degree, measured by regularity and method in all that is done. One hardly appreciates the loss (if such it can be considered) of giving half an hour a day to study, and yet in a year—Sundays and holidays excepted —this foots up the equivalent of about 20 days of eight hours each. Enough time, it is evident, if taken in the aggregate to very considerably increase one's store of knowledge. It is related that John Tyndal's success began with his determination to devote all of his spare time to study, and so earnest was he in this effort that he arose for this purpose at five on the morning of the first day after he made this resolve and continued so to do for many years. One of the benefits of home study lies in the fact that it is generally impossible to proceed to more advanced study until that in hand has been mastered, so that there is a continued incentive to perfection in each day's work. Above all things the course of study should be clearly mapped out and persisted in. There should be no cursory reading, no skipping or slighting because the matter is not clear. There likewise should be no attempt to begin the course with studies too advanced. Arithmetic must be fully comprehended before algebra is attempted, geometry should be at least reasonably well understood before a course in drawing is entered upon, and to those who desire to study the languages English grammar is a first requisite. Books can be purchased at reasonable rates, and but few are required at a time by the home student, so that the real expense of his study need not be great.

Instruction by Correspondence.

As something between the evening class instruction and unaided individual home study there are gradually arising correspondence schools and courses of study conducted entirely by correspondence. The remarkable success of the Chautauqua circle in a line and by a method somewhat similar is evidence of the possibilities of an extension of the method. University extension is destined to do much along the higher lines of study, while less pretentious courses are likely to be presented to the mechanic and the artisan. Such a plan is that of the Correspondence School of Mechanics, which furnishes text books of its own preparation, conducts the instruction by mail and awards a diploma or certificate upon passage of the requisite examinations. While it is extremely difficult for a student under such a method to properly present in writing to the instructor the points that puzzle him, and perhaps as hard for him to understand the explanatiou that is written in reply, nevertheless there is, 1, a direct benefit in the necessity of clearly stating upon paper the existing difficulty ; 2, a consequent indirect instruction in English composition ; and, 3, an advantage in having the instructor's reply permanently recorded where it can be read and reread until the meaning is clear. Of course, such instruction by correspondence cannot be furnished without charge, but in the case of such schools or courses as are already in operation the expense

is by no means excessive. In fact, the cost of an education by any one of the three methods here presented should not, and to a determined young man will not, be a serious hindrance. If he is sufficiently resolute to attempt and persist in a course of study he will somehow, even by serious self denial in other things, set aside the means to accomplish the end he has in view. He will make of himself a better, a nobler, a wiser and a more capable man.

Not the Time for Strikes.

As mild weather resumes its sway, says *The Iron Age*, the strike season begins. It was much to hope that the bitter period of adversity through which the country passed last summer had permanently changed the attitude of labor leaders and implanted among their followers a spirit of quiet resiguation to untoward circumstances. When factories were shut down on every side and thousands of willing workers were thrown out of employment in every manufacturing center, reductions in wages were accepted almost without a murmur by even the craftsmen who are ordinarily the most turbulent and uncontrollable. The times were then not only bad, but every one feared that they might be worse, and, besides, winter was at hand with its necessity for warm clothing, extra fuel and good food. Now, however, the chill winds have about ended, and with the advent of spring work is naturally much more plentiful. The prospect is not so cheerless as it was last fall. Therefore, latent discontent with reduced wage scales is beginning to crop out, and strikes are making their appearance in various localities and in different trades. It is a most unfortunate time for such troubles, as there has not been a sufficient revival in business to justify advauces in wages, and in addition to this every strike now cuts down the purchasing power of the people, which needs to be kept up and built up as much as possible so as to help general business to emerge from the mire in which it has so long been floundering. Labor agitators who would precipitate trouble at a time like this are totally bereft of wisdom. But they and their following may to some extent be influenced by the false statements of reviving business which are now published for political purposes in great metropolitan journals. The newspaper which says, for instance, that the Illinois Steel Company have enough orders on hand to keep their South Chicago rail mill running night and day for two years does a very great deal toward stirring up unrest among workingmen. The statement is ridiculously incorrect, as every one connected with the iron trade knows or should know. And yet it has been copied all over the country, and has even been accepted as true by a trade journal which professes to have some connection with iron and steel interests. While we deprecate calamity howling, and believe that matters are mending instead of growing worse, yet business is in such condition that the precipitation of labor troubles on the large scale now threatened will give it a serious backset. Those who write for the public eye should confine themselves strictly to the truth. There is a serious responsibility on their shoulders.

We are informed that applications for sheet metal pattern cutting instruction have been coming in to Professor Richards, director of the Trade School of the Pratt Institute, Brooklyn, quite freely. If the number of candidates increases at all between now and next September, the starting of a class during the latter month will be assured.

Williamson Trade School.

The first commencement of the Williamson Free School of Mechanical Trades, Elwyn, Delaware County, Pa., was held on Monday, April 2, when diplomas were awarded to 46 graduates. The trades taught at the school, namely, bricklaying and plastering, carpentry, machine work, and pattern making, each contributed about an equal number of students to the total number graduating. The students were addressed by Governor Pattison of Pennsylvania, Mayor Stuart of Philadelphia, Hon. John Wanamaker, and other notabilities. President Schrigley of the school gave a very encouraging account of its progress and utility. All the buildings have now been completed and equipped, and yet there are now more available funds in the treasury of the school than there were at starting. The average age of the graduates was 19½ years.

News and Notes.

Governor Flower has signed a bill passed by the New York Legislature prohibiting the erection of bank buildings at a greater cost than 25 per cent. of the net surplus of the institution.

New Hampshire advices report a poor maple sugar crop.

Over 3000 applications are said to have been received for the prize of $50,000 offered by the Metropolitan Traction Company of New York for a system of street railroad power superior to the overhead trolley system and equally cheap of operation.

The decline of agriculture in England is becoming a serious question. Every year sees more and more land going out of cultivation. The decrease last year was 176,000 acres, and during the last 20 years nearly 2,000,000 acres have been abandoned.

The city of Detroit is to do its own lighting.

The *Journal of Railway Appliances* is of the opinion that iron car construction has taken permanent root in this country.

The River and Harbor bill which was reported to the House last week carries an appropriation for the fiscal year ending 1895 of about $9,500,000, which is $12,000,000 less than that for the current fiscal year and $30,000,000 less than the estimates submitted by the Government engineers.

Of the 55,768,000 bushels of grain exported from the port of New York during the year 1893, not one bushel was carried in an American vessel. The grain carrying trade is exclusively in the hands of foreigners.

A reorganization committee for the Atchison Railroad is in process of formation.

The battle ships "Iowa" and "Brooklyn," now under construction at the Cramps' shipyard, Philadelphia, will be ready for launching in the fall.

The statement that the Pennsylvania Railroad Company is interested in the North River Bridge project, to connect New York and Jersey City, is officially denied. One of the principal Pennsylvania officials is quoted as saying that when the road enters New York it will be underground, not overhead.

Views of a Welsh Tin Plate Manufacturer.

E. R. Daniel, a Welsh tin plate manufacturer, has recently returned home from a business visit to the United States. His observations while in this country have led him to the conviction that the Wilson bill will pass the Senate in the same form in which it passed the House of Representatives, and that afterward the Welsh tin plate industry will revive and the American will languish. The grounds for this confidence he gives in an interesting interview lately published in the *Western Mail* of Cardiff. Assuming that a $1\frac{2}{10}$ cents duty is to be imposed, he remarks as follows: "There is no doubt in my mind that when it does the Americans will not be able to compete with us in the manufacture of tin plates. They don't economize in material so carefully as we do, and so they can't put the finish on the article for our price, especially at the high wage rates prevailing. I called at a little place near Pittsburgh where they were turning out 4500 boxes of plates weekly, 1500 of which they coated there and the rest sent elsewhere. I got it from the owners themselves that they would not be able to make tin plates profitably if the Wilson bill passed. And so at Taylor's works, Philadelphia, and other places. There seemed to be but one opinion on the point, and that the same as I have stated." Being asked whether there really are tin plate works to be found in America, Mr. Daniel replied: "Oh! yes, a few; and one or two very good ones, I can tell you." The trade in this country he reports to be as bad as bad can be. In metals he found no stocks anywhere; every one working their last pound, and only buying from hand to mouth. From this he infers that in a couple of months after the passage of the tariff bill better things will be seen in Wales. "Consumption out there," said he, "has not ceased, yet our Welsh works have been idle. The canning season will be upon them directly, and what are they to do but take our plates?

"And another thing," said Mr. Daniel in conclusion, "the Americans, you know, have been exporting very much more than they have been importing of late, and they can afford to send us a few orders without injuring their balance of trade."

Dispatches from all parts of the country indicate that the severe cold of the last few days has done great damage to budding fruit trees and growing crops.

THE LETTER BOX.

Loss of Steam Pressure.

From H. B. C., *St. Louis*.—In our plant here we have two boilers, capacity 30 and 60 horse-power, with 4-inch main reduced to 3 inch, running about 100 feet and tapped by ¾ inch pipes running to our jacket kettles. The feed pipes on the kettles are ¾ inch and the same size return. The returns empty into steam traps which stand boiler pressure. We have steam gauges on our kettles, and while our steam gauge on our boiler shows a pressure of 80 pounds and on the main 2 feet from the kettles shows 75 pounds, the gauge on the kettles shows but 20 pounds. We have examined the pipes and know they are perfectly clear, and do not understand why we cannot get a pressure on the kettles within a few pounds of the main. We use copper kettles, steam jacketed, with a capacity of from 1 to 4 barrels. We have had some of our steam experts here pass on the matter, and they do not seem to understand why we cannot get the pressure, so we concluded to submit the problem to *The Metal Worker* and its readers for solution. We would state that in our other factory, from which we recently moved, our main was a 2-inch one from 80 horse-power boilers, and the gauge on our kettles showed but 10 pounds lower pressure than the gauge on our boilers. All our kettles are within 2 feet on the main and the valves are all new Jenkins valves, and there is no leak that we can see in any way in the main.

Note.—This problem should elicit some interesting opinions from our readers. The trouble is probably due to some defect in the system which has been overlooked. A number of experts have been consulted and none can give a satisfactory explanation, but all agree that there is something that has been overlooked which an experienced man would soon detect. The employment of such a man will be the best way to secure service, and in the mean time some suggestions may be received. We hope our correspondent will describe what caused the trouble when it is found.

A Question in Lead Burning.

From H. D. T., *Scranton, Pa.*—Please inform me through *The Metal Worker* what acid or preparation it is that is sometimes used in lead burning.

Answer.—Speaking of acids in connection with lead burning, there comes to mind the dilute sulphuric acid that is used in generating the hydrogen gas. Our correspondent, however, evidently means something else. We have submitted this matter to H. J. Bailey, Pittsburgh, Pa., a well-known expert in lead burning, and from his reply we quote as follows: "The acid or solution that you ask about is a solution of the double chlorides of ammonia and zinc. This is the king flux solution. Some lead burners use the following solution: Into muriatic acid put shreds or clippings of sheet zinc and let stand until all bubbling ceases. Some add 1 ounce of sal ammoniac to each pound of this solution. A good lead burner, however, needs no flux. He cleans his lead edges with the shave hook and proceeds to unite or burn the edges together by means of the non-oxidizing flame. The acid he inquires about is used only where the lead burner has burnt the lead by the oxidizing flame, which would not have happened if he had understood the nature of the flame he was working with."

Rosining Roof Seams.

From J. J., *Hohokus, N. J.*—Seeing the different letters in *The Metal Worker* about roofing, I contribute a description



Rosining Roof Seams.

and a sketch of an apparatus and method I use in rosining seams for flat seam roofing. After the seams are all flattened down with the mallet, I take the fine rosin which accumulates in the barrel and put it in a funnel shaped device with a handle of 1¼-inch iron and about 2 feet long and spread it on the seams. The funnel part is about 4 inches in diameter at the large end and 3/16 inch at the bottom, and is about 6 inches long When this is filled with rosin I put the end with the small hole on the edge of the seam and run a hot copper into the fine rosin, which melts it, and it runs out as the device is drawn along the seam, leaving the seam all ready for the application of the hot copper and solder.

Trouble With Solder.

From A. D. E., *New York*.—Having experienced some trouble in getting a good wiping solder, I bought some tin and lead from a house that is reliable in furnishing pure articles, and mixed 4 pounds of tin and 6 pounds of lead and made up 100 pounds of solder. With this solder, try as I may, I cannot get a bright joint, no matter how hot the solder or how quick I wipe it. Will you kindly answer me through *The Metal Worker* if there is a certain brand of tin or lead required to make bright wiped joints?

Answer.—We think our correspondent's trouble is due to some impurity rather than to the brand of goods used. Some plumbers always use Banca tin and are careful to get pure lead, never using new or old lead pipe, though sheet lead is not objected to. By sprinkling sulphur over a pot of solder heated red hot and stirring it in thoroughly the solder can be cleaned and then tried on a joint, when if it turns out bright a sufficient proof may be had of the impurity. Then by adding the tin and good sheet lead the metals causing the trouble can be discovered.

Poportions of Fire Places.

From F. A. F., *Helena, Mont.*—Will some one please give me, through the columns of the paper, the proper depth and hight for fire places in which andirons are to be employed? I desire to know what should be the depth and hight of fire places 3 feet wide, 3 feet 6 inches wide, 4 feet wide, 4 feet 6 inches wide and 5 feet wide. There are very few fire places in this town which give satisfaction, as most of them smoke, and I think the fault is in the depth and hight of the fire place when compared with its width.

Note.—We referred the above inquiry to one of the leading grate manufacturers in this city, who furnishes the following touching the points raised by our correspondent: The proper dimensions of a fire place depend upon the size of the flue and its form. Usually the fire place is made 30 inches wide, 30 inches high and 12 inches deep, in connection with a flue 8 x 8 inches. A safe rule for regulating the size of the flue in its relation to the fire place is to make its area one-eighth that of the product of the width and hight of the fire place in inches. Thus a fire place 4 feet wide by 4 feet high, giving an area of 2304 inches, should have a flue area of 288 inches, or about 17 inches square. This, however, is only a general rule, applicable more particularly to high fire place openings. Smaller fire places, as the 30 x 30 inches, will work well with a flue area less than one-tenth of the area of the fire place opening. A matter not less important than the size of the flue is its shape where it joins the fire place. No flue is a good one which does not slope at an angle of 45° from the horizontal line. While the smoke is hot it should reach the narrowest or smallest part of the flue, and that point should not be over 20 to 24 inches above the top of the fire place. There would be few complaints of smoky fire places if builders gave proper regard to the shape of

the flues, and never was this caution more necessary than it is at present, when corner fire places are so much in vogue. Some masons think that if they make a flue very large all danger of bad draft may be avoided, but this is a great error. There is as great danger in making a flue too large as in making it too small. A flue should be no larger than is necessary to carry off the greatest volume of smoke that is made by the fire. If larger, eddies or counter currents are formed which greatly impair the draft.

The Capable Man.

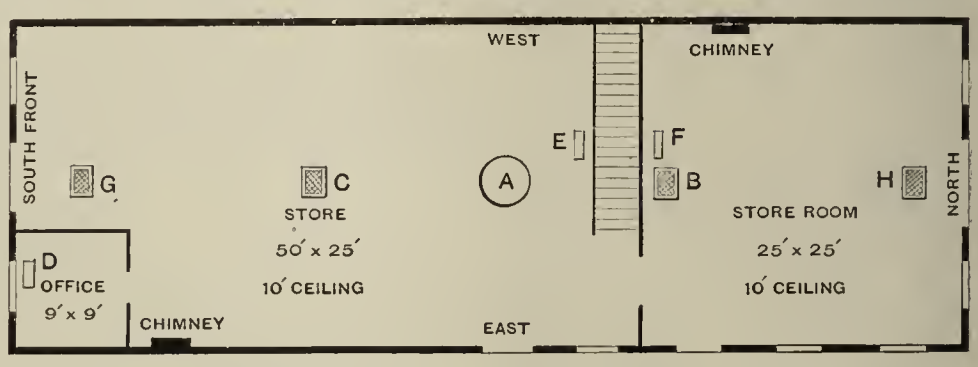
From MECHANIC.—In an article in *The Metal Worker* of March 10, page 27, which was reprinted from the *Clay Worker*, I think some erroneous statements were made respecting a capable man being seldom out of a job even in hard times. I have worked in several shops, and talked with a great many in different callings who have worked under various foremen, and all the evidence I can get goes to show that the survival of the fittest is not the rule, but rather the second or third best retain their positions. The average foreman is afraid to keep a man who is competent or perhaps a better mechanic than himself for fear of losing his position, while by keeping the second-class man who is not able to turn out so much or so fine work, he renders his position more secure. His star appears all the brighter when viewed from the manager's office from the mere fact of being surrounded by such dim lights. I will warrant that many readers of your paper have left good positions simply because the foreman did not feel at ease when they were working, and so took the first opportunity to have them dispensed with. Any person who has read history knows perfectly well that it was not the best man who occupied positions of trust in all cases. In many instances a good man may get a fair start, but just so soon as he begins to crowd those at the top, off goes his head. If the manager will send some one around among the men, now and then, to find out what the mechanics think, men would remain longer in the same shop. Another test is to give the foreman an extra difficult piece of work, then watch and see if he gives it to the man who keeps steadily employed or to the man whom he lays off. It always seemed strange to me to see the foreman give one man first class work to do during the busy season and another nothing but common work (who couldn't do a smooth job to save his life), but as soon as trade slackened the good mechanic was laid off.

Note.—We print our correspondent's letter, not because we agree with him, but simply to illustrate the feeling of a certain class of men. While all that he says is true in some and perhaps many cases, it is not the universal rule. There are many small minded, jealous foremen, undoubtedly, but we believe that there are more foremen who are superior to these petty notions. Very often a first-class workman fails to keep a steady job, simply by reason of some personal peculiarity—an offensive manner, or a spirit of criticism, or some trick or other that makes him a disagreeable companion, though his work may not have any defect. We suggest to our correspondent that he bear this fact in mind as a possible explanation of some of the cases where a competent man is laid off and not ascribe it entirely to the foreman's jealousy.

Wants Suggestions on Heating.

From J. P.. *Millbrook, N. Y.*—I have a 271 Fuller & Warren Company combination warm air and hot water heater, which I want to use to heat the store shown by the plan and would like suggestions on putting it in so as to use both kinds of heat successfully. It is a two story brick building, to be used as a hardware store, and I want to heat the first floor comfortably, and the second floor, which is all in one room, I only want to take the chill off. The office partition is only 6 feet high and the ceilings are 10 feet. There is a cellar under the whole building. Where should the heater be set and where should the registers and radiators be placed ?

Note.—No doubt different opinions exist as to what is best in this case, and we hope they will be expressed in *The Metal Worker*. A good location for the heater will be 6 feet south of the stairs, at the center of the building, at A. A 14-inch pipe should be run to a 14 x 20 register, at B, in the back storeroom, and a 16 inch pipe should run 10 feet toward the front of the store, to a 16 x 20 register, at C. A 1-inch pipe should be run to a radiator containing 40 square feet of surface, at D, and a 1¼-inch pipe should be run to a point below the radiator E, located near the stairs on the upper floor. At this point a 1¼ inch riser should be taken to the radiator, and the main reduced to 1¼ inch and continued until it rises to the radiator, at F, on the other side of the stairs on the second floor. The second story has 18,750 cubic feet of space, and as a moderate temperature will be satisfactory if 1 square foot of surface is used for every 90 cubic feet of space, 100 square feet of surface exposed in each of the radiators will be ample. The returns from the radiators should be run the same as the flow pipes and should connect at the return in the heater. All of the water pipes should have a pitch from the heater, without any dips, to secure a good flow through the system. All the radiators should have air valves at the top. An expansion tank should be located near the ceiling on the second floor and be connected by a 1-inch pipe with the return pipe in the basement at the most convenient point. As the store will probably have a sufficient change of air through the opening and closing of the doors, the furnace may take its supply from the basement, if it is kept clean, and a circulation can be kept up by placing a 14 x 20 register in the floor, at G, in the front store, and one at H in the back store. As there are two chimneys, one can be used as ventilating shaft if desired, using that having the better draft for a smoke flue.



Wants Suggestions on Heating.

Wants a Sewer Trap.

From J. L., *Danville, Pa.*—Please give me some information in *The Metal Worker* about the trapping of sewers in city outlets. We have an 18-inch terra cotta sewer here and have taken several 15-inch outlets for surface water at the gutters. When the water in the river gets low the end of the sewer is exposed and a disagreeable smell comes from the street outlet. I cannot get a 15-inch terra cotta trap and would like to know some method of trapping that would overcome the trouble.

Answer.—Terra cotta running traps 15 inches in diameter can be bought from several different makers, but are not carried in stock and two weeks would be required to fill an order. They are preferable to what are known as mason's traps, as they are likely to be flushed clean when the full bore of the pipe is filled with water, and consequently do not fill up with dirt so readily. If a mason's trap is to be used, some trouble should be taken in building it to have the turns easy. It consists of a chamber having dimensions twice those of the inlet and outlet in depth and length. Both the inlet and outlet should run from the side of the chamber as near the top as possible. In building the trap a stone or iron partition should extend down from the top of the chamber two or three inches below the bottom of the inlet and outlet, and should be placed across the chamber midway between the openings. The inlet may enter the top of the chamber on the inside of the partition, otherwise a manhole must be provided for cleaning. Care should be taken to have the chamber and the partition separating the two parts made air tight;

then, when water fills the lower part of the chamber and the partition extends down into it, the sewer air cannot escape to the street outlet.

Roofing Material Wanted.

From M. H. R, *Winnipeg, Manitoba.*—Your Letter Box department has solved so many practical difficulties that I venture to ask your advice with respect to roofing material suitable for this climate, which, as you are probably aware, is, on the whole, very dry, but subject to occasional wet intervals, and with a variation between lowest winter and highest summer temperature of about 150° F. (from 50° below zero to 100° in the shade). Different materials have been tried, but all are more or less defective. What seems to be wanted is some material impervious to wet, and which will not expand or contract as between hot and cold and wet and dry seasons. Ordinary tin or metal roofing expands and contracts so much that even if at first properly laid down and fitted, leak holes soon appear and give trouble, more particularly during the mild spells in winter when there is snow on the roof. I trust that some of your readers can suggest a remedy for the trouble named.

Note.—It is an interesting topic that our correspondent suggests for discussion, and we would like to have opinions from practical readers that we might print them for his assistance. Two methods of meeting the problem are either to use a metallic roof and so lay it that the great expansion and contraction will be provided for, or else make use of some material which does not vary so much between the limits of temperature mentioned. Trouble with most of the softer materials, if we may so classify them, is that they are not so enduring, as a rule, as the metallic roofs; but on the other hand, it should be borne in mind that the climate of Winnipeg is very dry and is therefore not so destructive as the climate elsewhere and near the seaboard. Our correspondent gives a limit of temperature from 50° below zero to 100° in the shade. But it must not be forgotten that the roof is exposed to the sun temperature, which, with the thermometer at 100° in the shade, would be very likely to register up to 130° or 140°.

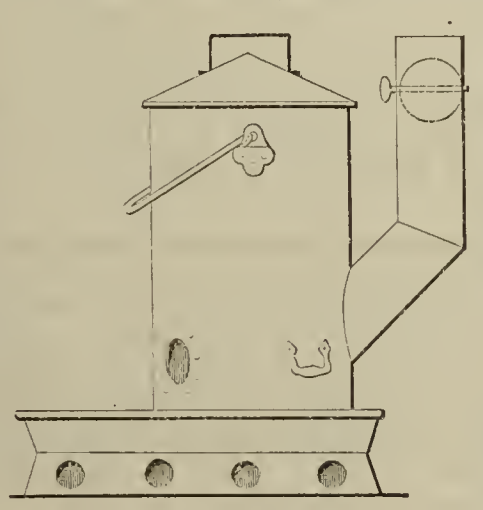
Should be Brazed.

From A TINSMITH, *New York.*—I wish to get some information through *The Metal Worker* about a job that is giving me trouble. I am putting brass blocks on steel heel plates. The plates are ground bright and I tin them thoroughly, as well as the brass blocks, and join them while they are hot by holding over a fire, but when they cool they come apart and all of the solder is on the brass block and the steel plate is as clean as it was before I tinned it. I use half and half solder, but cannot use acid, as it would make the plates rust. The plates are well coated with solder and I would like to know why the solder does not stick and what I can use instead of acid. I have used pure block tin, but with no better success.

Answer.—If the articles are thoroughly washed in clean water after tinning there will be no acid left to produce rust, and an acid flux will secure a stronger union of the two parts and may be sufficient. If considerable strength is desired brazing will prove more satisfactory and is done by cleaning the surfaces to be united and using borax as a flux and hard solder of a composition that will melt before either of the parts are melted. Usually a red heat is required for fusing. The fusion may be effected at a lower temperature by using different alloys or proportions. One part copper and one part zinc is given by a recent book as a generally used proportion. The alloy is cast in ingots, which are heated red and hammered, and at the right temperature it will granulate in lustrous yellow particles, when it is ready to be used. A more readily fusible composition is given as 44 parts copper, 49.9 parts zinc, 3.3 parts tin and 1.2 parts lead. If the brass blocks and steel heel plates are united by these solders the trouble reported will be overcome

Roofing Fire Pots.

From J. D. G., *Boseman, Mon.*—In response to the request of "F. W. S." in *The Metal Worker*, March 3, I sub-



Roofing Fire Pots.

mit a sketch of my roofing fire pot. It is 16 inches high, 9 inches in diameter and sets on a 10 x 16 inch base 1 inch high, with a 1-inch rim around the top. The base is ventilated by several ½-inch holes around the bottom, and both it and the rim are wired to give strength. The rim is to catch the coals that are drawn out with the coppers. A 3-inch pipe connects at the bottom and runs up to the top with a damper in it. The front is lined with heavy sheet iron and is riveted around the holes. The top has a tight lift off cover.

Left Handed Tinners.

From W. S. L.—Although the question has been pretty well exhausted, I nevertheless would like to say a few words on this topic. When I was young I was very right handed, but took it into my head that it would be convenient to use both or either hand, and by some practice and perseverance I became handy with both. I had an apprentice some years ago who was left handed, and although awkward at first, in a short time he could use one hand as well as the other, which gave him an advantage in shop work. I believe it would be a benefit to a great many men if when young they were trained to use both the hands at all kinds of work. There might be an exercise in the schools for the purpose of training in the use of both hands, if only for half an hour a day.

Small Air Bound Pipes.

From HELIOS. — Referring to the letter of "E. J. S.," page 30 of *The Metal Worker* of March 17, will say that if "E. J. S." will take a ½-inch pipe connection from the horizontal pipe over the door and run it up and over the tank on the second floor, leaving the end open, all the air can pass out when the boiler is filled with water. If the water in the boiler at any time should reach the boiling point, all the steam will escape from the pipe over the tank. This connection will stop all the rumbling noise and allow a free circulation of the water. Would advise taking out all the ½-inch pipe and make it ¾ inch inside diameter with a ½ inch air pipe over tank.

Hot Water from Cold Faucet.

From HELIOS.—Referring to the letter of "L. J. P.," page 32 of *The Metal Worker* of March 17, will say that by placing a swing check valve in horizontal cold water pipe over the boiler, with the valve set to close when the faucet is opened over the sink, it will stop the hot water from leaving the boiler through the cold water pipe. If a check valve is placed in the cold water supply pipe to a boiler, there will have to be connected to the hot water pipe a water relief valve. The waste from the relief valve can be connected and discharged over the sink. There will also have to be placed on the boiler a vacuum valve to allow the air to enter the boiler and prevent the collapsing of the boiler.

Miter Patterns.

From SUBSCRIBER.—I would like to be informed how to obtain the patterns for a square return miter, an octagonal miter, and for a butt miter against a curved surface.

Answer.—Referring to "The Metal Worker Pattern Book," the answer to the first question can be found on page 153, to the second on page 211, and to the third on page 155.

Cleaning Zinc.

From T. G. S., *Genoa, Ill.*—Will *The Metal Worker* or some of its readers give me a receipt for cleaning and polishing zinc?

Answer.—A well-known receipt book says zinc is generally mechanically pickled by scouring with sand and powdered pumice. The bath used for brass is also very effectual; it is composed of one part of ordinary nitric acid and one part of sulphuric acid and must be washed off with clean water. To larger articles which cannot be dipped in the bath of acid and water apply a solution of potassium-ammonium tartrate thickened with sufficient clay to form a fluid paste. After a few hours rub the article with a brush dipped occasionally into fine sand moistened with the pickle, then polish with powdered charcoal or Vienna lime.

Fuel for Furnaces.

From FURNACE DOCTOR, *Rochester, N. Y.*—The high price of fuel makes every one desirious of using that which is cheapest. After 15 consecutive years' experience in caring for furnaces, sometimes as many as 20 at a time, I feel that I am in position to express an opinion on the relative values of different kinds of fuel. To heat a house cheaply the furnace should be very large in proportion to the size of the house to be warmed. It should be filled with fuel and the draft closed, thereby insuring more nearly perfect combustion. In giving my opinion about fuels I will first relate my individual experience. The house in which I live is a new one, built three years ago, two stories, brick, three rooms and hall below and three rooms and bathroom above. The first winter I used gas coke for heating with a furnace of ample size. I paid 5½ cents per bushel for coke, and it took 250 bushels to carry me through the season, costing $28.60 in all. Coal at the time was $4.50 a ton, and as I afterward learned it would have required 9 tons, which would have amounted to $40.50, making a saving of $11.90 for that year. The next winter I used the same amount, 250 bushels, at a cost of $37.40, the price being raised twice. The price of coal that year was $5 a ton, which for 9 tons would have amounted to $45. Again, you see, I made a liberal saving. The present winter gas coke has been 8 cents per bushel and so last fall I decided to try coal at $5 a ton. Before the season closes I shall have used just about 9 tons. By using coke at 8 cents a bushel there would have been a slight saving in money and I would have had much more satisfactory results so far as heating is concerned, for, on account of a weak draft in the chimney, the coal takes a long time to get burning, while coke burns up readily, and when the draft is closed it holds the fire well.

In addition to my own experience I have a good deal to do with other houses, of which I will send some account. In large houses I burn from 15 to 17 tons of coal a season, and I find that the Pennsylvania coke, prepared expressly for fuel, shipped to this market, and sold at present at $4 a ton (coal now being $4 25) would do a little more work, or, rather, last a trifle longer, ton for ton, and at the same time make a vastly better fire than coal. As I am not in the interest of any coal dealer, but work for the interests of my patrons, I always advise them to use coke, and it has been the means of saving them many dollars. Three winters ago I was called to take care of a steam heater in the residence of a physician, who had been using coal at the rate of 2 tons in about 25 days. When I took the furnace the coal bin had just been filled up, and my experience was about the same. I then advised the use of Pennsylvania coke, and the result was, at $1.25 per ton less cost than coal, it lasted about three times longer. From that day to the present I have used no more coal in that furnace. As spring comes on and the weather gets warmer I have used gas coke and find for a very low pressure of steam that it has been a still further saving. Just at present I am using a small sized Pennsylvania coke, and find for raising steam it equals gas coke in economy. I will give a third example to illustrate what has been my experience. For the past eight years I have had charge of a furnace which uses 17 tons of coal per season. After a while I said to the householder that coal was dear, and advised the use of coke. I put in 200 bushels of gas coke at 6½ cents a bushel, making $13, which lasted until nearly Christmas. Then 7 tons of Pennsylvania coke at $3.75 a ton, amounting to $26.25. When that was used up mild weather had again arrived, and 100 bushels of gas coke, costing $6 50, carried the furnace through the season, the total cost being $45.75, against 17 tons of coal, which would have cost at $5 a ton $85, thus saving $39.25. I have used coke in that furnace ever since. I am just now taking care of 12 furnaces, and in only three am I using coal. To summarize very briefly, I find coke as a fuel for heating to be much the cheaper when used judiciously. In mild weather use gas coke, and in more severe weather Pennsylvania coke.

Note.—This letter from our correspondent is particularly interesting, as it deals with a very important matter —namely, the cost of fuel for warming houses. We wish our readers would take this occasion to tell us what experience they may have had with other fuel in comparison with coal.

Will Syphon Work?

From P. & L., *Woodstown, N. J.*—Wishing to syphon water out of a well 20 feet deep, would like to know from *The Metal Worker* or its readers if a ¾ inch pipe about 200 feet long will do the work, or will a larger pipe be necessary? The fall is sufficient and the length is mentioned that the conditions may be understood. The water is to be carried down a hill from a barn.

Note.—In *The Metal Worker* a few years back a correspondent stated that he had laid 1540 feet of 1-inch galvanized iron pipe from a brook to a tank, over a hill 29 feet high, and was able to fill the tank, which held 1200 gallons, in four hours. This will give our correspondent some practical information, but we should be glad to hear from others on the subject.

Swelled Boiler Piping.

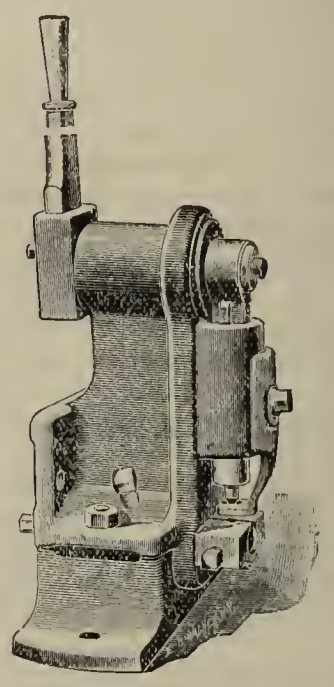
From E. H., *Nyack.*—A number of years ago I was called upon to repair the hot water pipe from a water back to a boiler. I found the boiler to have an open top with loose cover. Into this boiler the water was pumped as it became empty. The pipe close to the joint where the heavy lead pipe was wiped on the brass nipple at the side of the boiler was swelled to fully double the size of the other pipe, and had opened just enough to make a very small leak. The owner told me it had done so before, and wished me to make a new joint. I accordingly repaired it, but suggested that probably only an iron pipe would be a permanent remedy. About two weeks after I was called to replace the lead pipe with iron, as it had again given out. It has now been in use about five years with no further trouble. I would like to know if this is a common occurrence with such boilers, or is it owing to some local circumstance in this case?

Last fall I was called for the first time to a boiler which was supplied by pressure, not very heavy. In this case the lead pipe from water back to boiler had been swelled out of all proportion and been repeatedly mended next to the water back connection. It was leaking and I mended it as it had been mended before. In this case the break was through the solder, which seemed to have been almost as thick as the pipe. In a few weeks' time I replaced this with iron pipe, as another leak showed itself. We have had no further trouble. One more case was somewhat similar, only in this the pipe gave out next the boiler, and after several times repairing I substituted iron pipe, which remedied the difficulty. These troubles all doubtless arise from imperfect circulation, but why should they act so differently? I thought it might come from the boiler tube being so short that the cold water is discharged so close to the inlet for hot water as to cause it to damage this pipe every time. If such is the fact it becomes a very important matter to see that this tube extends well toward the bottom of the boiler.

Answer.—The swelling of the return pipe to the boiler is a quite common occurrence, and happens when the water back has a large heating capacity and when the water pressure is very light, as is stated in the cases reported. It is not due to the tube in the boiler or any unusual local condition. In *The Metal Worker*, March 17, an illustration and explanation of the trouble is given in the article entitled "Water Hammer and Boiler Connections."

Hand Power Scroll Punch

This tool, made by the W. & S. Hydraulic Machinery Works, 204 East Forty-third street, New York, is designed for the use of those who have to punch holes through small scroll bends. In order to obtain the greatest stiffness with small size the dies are located in the ends of a tool steel bar passing through the body of the machine. The bar is 1 inch in diameter at one end and is flattened to a larger circle at the other, and the centers of the dies are ⅝ inch from the end of the bar. A small table for punching flat iron is shown in position attached to die bar. The punch, as shown, is to be bolted down to the bench, but it can be detached and bolted to a post if desired. There is also a special projection for holding it in a vise. The lever is easily removed, as it slips into a socket, as shown. The tool and stand weigh 60 pounds.



Hand Power Scroll Punch.

NET PRICE OF GALVANIZED SHEET IRON.

The table printed below gives the net price of Galvanized Sheet Iron of the gauges in common use at discounts from 65 per cent. to 85 per cent. from the present list. The gauges, based on weights, are according to the United States standard which came into effect July 1, 1893, the galvanized sheets being 2½ oz. per square foot heavier than the black iron of the same number.

No.	10	12	14	16	18	19	20	21	22	23	24	25	26	27	28	29	30
List price per lb.....	12c.	12c.	12c.	12c.	13c.	13c.	13c.	13c.	14c.	14c.	14c.	15c.	15c.	16c.	17c.	19c.	21c.
Ounces per sq. ft.....	92½	72½	52½	42½	34½	30½	26½	24½	22½	20½	18½	16½	14½	13½	12½	11½	10½
Pounds per sq. ft.....	5.78	4.53	3.219	2.656	2.156	1.906	1.656	1.53	1.406	1.28	1.156	1.03	.906	.8437	.7812	.7187	.6562
List price per sq. ft.	**69.36**	**54.36**	**38.62**	**31.87**	**28.02**	**24.77**	**21.52**	**19.89**	**19.68**	**17.92**	**16.18**	**15.45**	**13.59**	**13.49**	**13.28**	**13.65**	**13.78**
DISCOUNT.	Cents.	Cents.	Cents	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents.	Cents	Cents.	Cents.	Cents.	Cents.
65%..... Per lb...	4.2	4.2	4.2	4.2	4.55	4.55	4.55	4.55	4.9	4.9	4.9	5.25	5.25	5.6	5.95	6.65	7.35
" sq. ft.	**24.27**	**19.02**	**13.52**	**11.14**	**9.81**	**8.67**	**7.53**	**6.96**	**6.89**	**6.27**	**5.66**	**5.40**	**4.75**	**4.72**	**4.65**	**4.78**	**4.82**
65 & 5%... " lb....	3.99	3.99	3.99	3.99	4.32	4.32	4.32	4.32	4.65	4.65	4.65	4.98	4.98	5.32	5.65	6.31	6.98
" sq. ft.	**23.06**	**18.07**	**12.84**	**10.59**	**9.31**	**8.23**	**7.15**	**6.61**	**6.53**	**5.95**	**5.37**	**5.13**	**4.51**	**4.49**	**4.41**	**4.53**	**4.58**
65 & 10%... " lb....	3.78	3.78	3.78	3.78	4.09	4.09	4.09	4.09	4.41	4.41	4.41	4.72	4.72	5.04	5.35	5.98	6.61
" sq. ft.	**21.85**	**17.12**	**12.16**	**10.03**	**8.82**	**7.79**	**6.77**	**6.25**	**6.20**	**5.64**	**5.09**	**4.86**	**4.27**	**4.25**	**4.18**	**4.29**	**4.33**
67½%..... " lb....	3.90	3.90	3.90	3.90	4.22	4.22	4.22	4.22	4.55	4.55	4.55	4.87	4.87	5.20	5.52	6.17	6.82
" sq. ft.	**22.54**	**17.66**	**12.55**	**10.36**	**9.10**	**8.04**	**6.99**	**6.45**	**6.39**	**5.82**	**5.26**	**5.01**	**4.41**	**4.38**	**4.31**	**4.43**	**4.47**
67½ & 5%. " lb....	3.70	3.70	3.70	3.70	4.01	4.01	4.01	4.01	4.32	4.32	4.32	4.63	4.63	4.94	5.24	5.86	6.48
" sq. ft.	**21.38**	**16.76**	**11.91**	**9.82**	**8.64**	**7.64**	**6.64**	**6.13**	**6.07**	**5.53**	**4.99**	**4.77**	**4.19**	**4.16**	**4.09**	**4.21**	**4.25**
67½ & 10% " lb....	3.51	3.51	3.51	3.51	3.80	3.80	3.80	3.80	4.09	4.09	4.09	4.38	4.38	4.68	4.97	5.55	6.14
" sq. ft.	**19.78**	**15.90**	**11.30**	**9.32**	**8.19**	**7.24**	**6.29**	**5.81**	**5.75**	**5.23**	**4.73**	**4.51**	**3.95**	**3.95**	**3.88**	**3.99**	**4.03**
70%..... " lb....	3.60	3.60	3.60	3.60	3.90	3.90	3.90	3.90	4.20	4.20	4.20	4.50	4.50	4.80	5.10	5.70	6.30
" sq. ft.	**20.81**	**16.31**	**11.59**	**9.56**	**8.41**	**7.43**	**6.46**	**5.96**	**5.90**	**5.37**	**4.85**	**4.63**	**4.07**	**4.05**	**3.98**	**4.09**	**4.13**
70 & 5%... " lb....	3.42	3.42	3.42	3.42	3.70	3.70	3.70	3.70	3.99	3.99	3.99	4.27	4.27	4.56	4.84	5.41	5.98
" sq. ft.	**19.76**	**15.49**	**11.01**	**9.08**	**7.97**	**7.05**	**6.12**	**5.66**	**5.61**	**5.10**	**4.61**	**4.40**	**3.87**	**3.84**	**3.78**	**3.89**	**3.92**
70 & 10%.. " lb....	3.24	3.24	3.24	3.24	3.24	3.51	3.51	3.51	3.78	3.78	3.78	4.05	4.05	4.32	4.59	5.13	5.67
" sq. ft.	**18.72**	**14.67**	**10.43**	**8.60**	**6.98**	**6.69**	**5.81**	**5.37**	**5.31**	**4.84**	**4.37**	**4.17**	**3.67**	**3.64**	**3.58**	**3.68**	**3.72**
72½%..... " lb....	3.30	3.30	3.30	3.30	3.57	3.57	3.57	3.57	3.85	3.85	3.85	4.12	4. 12	4.40	4.67	5.22	5.77
" sq. ft.	**19.07**	**14.95**	**10.62**	**8.76**	**7.69**	**6.80**	**5.91**	**5.46**	**5.41**	**4.93**	**4.45**	**4.24**	**3.73**	**3.71**	**3.65**	**3.75**	**3.79**
72½ & 5%. " lb....	3.13	3.13	3.13	3.13	3.39	3.39	3.39	3.39	3.65	3.65	3.65	3.91	3.91	4.18	4.44	4.96	5.48
" sq. ft.	**18.09**	**14.18**	**10.07**	**8.31**	**7.30**	**6.46**	**5.61**	**5.18**	**5.13**	**4.67**	**4.23**	**4.02**	**3.54**	**3.52**	**3.47**	**3.56**	**3.59**
72½ & 10% " lb....	2.97	2.97	2.97	2.97	3.21	3.21	3.21	3.21	3.46	3.46	3.46	3.71	3.71	3.96	4.20	4.70	5.19
" sq. ft.	**17.16**	**13.45**	**9.56**	**7.89**	**6.92**	**6.12**	**5.31**	**4.91**	**4.86**	**4.43**	**4.**	**3.82**	**3.36**	**3.34**	**3.28**	**3.37**	**3.40**
75%..... " lb....	3.	3.	3.	3.	3.25	3.25	3.25	3.25	3.50	3.50	3.50	3.75	3.75	4.	4.25	4.75	5.25
" sq. ft.	**17.34**	**13.59**	**9.65**	**7.97**	**7.**	**6.19**	**5.38**	**4.97**	**4.92**	**4.48**	**4.04**	**3.86**	**3.39**	**3.37**	**3.32**	**3.41**	**3.44**
75 & 5%... " lb....	2.85	2.85	2.85	2.85	3.08	3.08	3.08	3.08	3.32	3.32	3.32	3.56	3.56	3.80	4.03	4.51	4.98
" sq. ft.	**16.47**	**12.91**	**9.17**	**7.57**	**6.64**	**5.87**	**5.10**	**4.71**	**4.66**	**4.25**	**3.83**	**3.66**	**3.22**	**3.21**	**3.15**	**3.24**	**3.26**
75 & 10%.. " lb....	2.70	2.70	2.70	2.70	2.92	2.92	2.92	2.92	3.15	3.15	3.15	3.37	3.37	3.60	3.82	4.27	4.72
" sq. ft.	**15.60**	**12.27**	**8.69**	**7.17**	**6.29**	**5.56**	**4.83**	**4.46**	**4.43**	**4.03**	**3.64**	**3.47**	**3.05**	**3.03**	**2.98**	**3.07**	**3.09**
77½%..... " lb....	2.70	2.70	2.70	2.70	2.92	2.92	2.92	2.92	3.15	3.15	3.15	3.37	3.37	3.60	3.82	4.27	4.72
" sq. ft.	**15.60**	**12.23**	**8.69**	**7.17**	**6.28**	**5.56**	**4.83**	**4.46**	**4.43**	**4.03**	**3.64**	**3.47**	**3.05**	**3.03**	**2.98**	**3.07**	**3.09**
77½ & 5%. " lb....	2.56	2.56	2.56	2.56	2.77	2.77	2.77	2.77	2.99	2.99	2.99	3.20	3.20	3.42	3.63	4.06	4.48
" sq. ft.	**14.79**	**11.59**	**8.24**	**6.80**	**5.97**	**5.28**	**4.58**	**4.24**	**4.20**	**3.82**	**3.45**	**3.29**	**2.90**	**2.88**	**2.83**	**2.91**	**2.94**
77½ & 10% " lb....	2.43	2.43	2.43	2.43	2.63	2.63	2.63	2.63	2.83	2.83	2.83	3.03	3.03	3.24	3.44	3.84	4.25
" sq. ft.	**14.04**	**11.**	**7.82**	**6.45**	**5.67**	**5.01**	**4.35**	**4.02**	**3.98**	**3.62**	**3.27**	**3.12**	**2.74**	**2.73**	**2.68**	**2.76**	**2.79**
80%..... " lb....	2.40	2.40	2.40	2.40	2.60	2.60	2.60	2.60	2.80	2.80	2.80	3.	3.	3.20	3.40	3.80	4.20
" sq. ft.	**13.87**	**10.87**	**7.72**	**6.37**	**5.60**	**4.95**	**4.30**	**3.98**	**3.93**	**3.58**	**3.23**	**3.09**	**2.70**	**2.70**	**2.65**	**2.73**	**2.75**
80 & 5%... " lb....	2.28	2.28	2.28	2.28	2.47	2.47	2.47	2.47	2.66	2.66	2.66	2.85	2.85	3.04	3.23	3.61	3.99
" sq. ft.	**13.18**	**10.36**	**7.34**	**6.05**	**5.32**	**4.70**	**4.09**	**3.78**	**3.74**	**3.40**	**3.07**	**2.93**	**2.58**	**2.56**	**2.52**	**2.59**	**2.62**
80 & 10%.. " lb....	2.16	2.16	2.16	2.16	2.34	2.34	2.34	2.34	2.52	2.52	2.52	2.70	2.70	2.88	3.06	3.42	3.78
" sq. ft.	**12.48**	**9.78**	**6.95**	**5.73**	**5.04**	**4.46**	**3.87**	**3.58**	**3.54**	**3.22**	**2.91**	**2.78**	**2.44**	**2.43**	**2.39**	**2.45**	**2.48**
82½%..... " lb....	2.10	2.10	2.10	2.10	2.27	2.27	2.27	2.27	2.45	2.45	2.45	2.62	2.62	2.80	2.97	3.32	3.67
" sq. ft.	**12.13**	**9.51**	**6.76**	**5.57**	**4.89**	**4.32**	**3.76**	**3.47**	**3.44**	**3.13**	**2.83**	**2.70**	**2.37**	**2.36**	**2.32**	**2.38**	**2.41**
82½ & 5%. " lb....	1.99	1.99	1.99	1.99	2.16	2.16	2.16	2.16	2.32	2.32	2.32	2.49	2.49	2.66	2.82	3.15	3.49
" sq. ft.	**11.50**	**9.01**	**6.40**	**5.28**	**4.65**	**4.11**	**3.57**	**3.30**	**3.26**	**2.97**	**2.68**	**2.56**	**2.25**	**2.24**	**2.20**	**2.26**	**2.29**
82½ & 10% " lb....	1.89	1.89	1.89	1.89	2.04	2.04	2.04	2.04	2.20	2.20	2.20	2.36	2.36	2.52	2.67	2.99	3.30
" sq. ft.	**10.92**	**8.56**	**6.08**	**5.02**	**4.4**	**3.89**	**3.38**	**3.12**	**3.09**	**2.81**	**2.54**	**2.43**	**2.14**	**2.12**	**2.08**	**2.15**	**2.16**
85%..... " lb....	1.80	1.80	1.80	1.80	1.95	1.95	1.95	1.95	2.10	2.10	2.10	2.25	2.25	2.40	2.55	2.85	3.15
" sq. ft.	**10.40**	**8.15**	**5.79**	**4.78**	**4.20**	**3.71**	**3.23**	**2.98**	**2.95**	**2.69**	**2.42**	**2.31**	**2.04**	**2.02**	**1.99**	**2.05**	**2.06**

STEAM AND HOT WATER.

Heating Coils in Furnaces.

The following interesting letter comes from a correspondent in response to a request for the rule he used for determining the size of a coil to be placed in a hot air furnace for heating, by means of radiatiors, rooms that were difficult to heat with hot air:

I have had no experience in the making or installation of hot air furnaces, therefore cannot contribute anything of interest on that subject. I know that the difficulty of heating distant rooms prevails to a considerable extent, as I hear many complaints and am frequently called upon to remove the cause, and in many instances have resorted to the coil in the furnace and radiators. I have always been successful in overcoming the trouble, but as to giving any reliable rule by which to calculate the amount of heating surface or coil necessary in the furnace, I am afraid I will have to give it up. The conditions vary so much in each case where I have been called that I do not think it possible to give or apply any rule to them. This is one of the many things that one man cannot tell another. The best I can do is to describe just what I did in a peculiar case, and perhaps a rule may be evolved from that which may be of some use.

About 15 years ago I was called to a large residence where there was a conservatory in the southeast corner of the house; one side, end and roof were of glass, with the side and slant roof facing toward the east. When the wind blew from the east they could not keep that part of the house warm; in fact, the plants would freeze even in moderately cold weather. The furnacemen did all they could, but did not help matters any. The furnace was a large one and was located about 20 feet away from the conservatory. I made a coil of 2 inch pipe and put it inside the fire pot, as shown in the illustration. It was put in in such a manner as not to interfere with the firing process, and to have 9 feet of 2 inch pipe inside the fire pot and directly over the fire and on a level with the top of the fire door. The next thing was to locate the required amount of heating surface in the room to be heated, which was 14 feet long, 7 feet wide and 6 feet 6 inches high. The shape of roof is shown in the cut. When I came to discuss this with the lady of the house, I met the first difficulty. Would she like a pipe coil around the outside walls, put up with return bends and neatly bronzed?

"Oh, no. It would spoil her shelves and burn her plants, and it would look too much like a factory; would not have that at all."

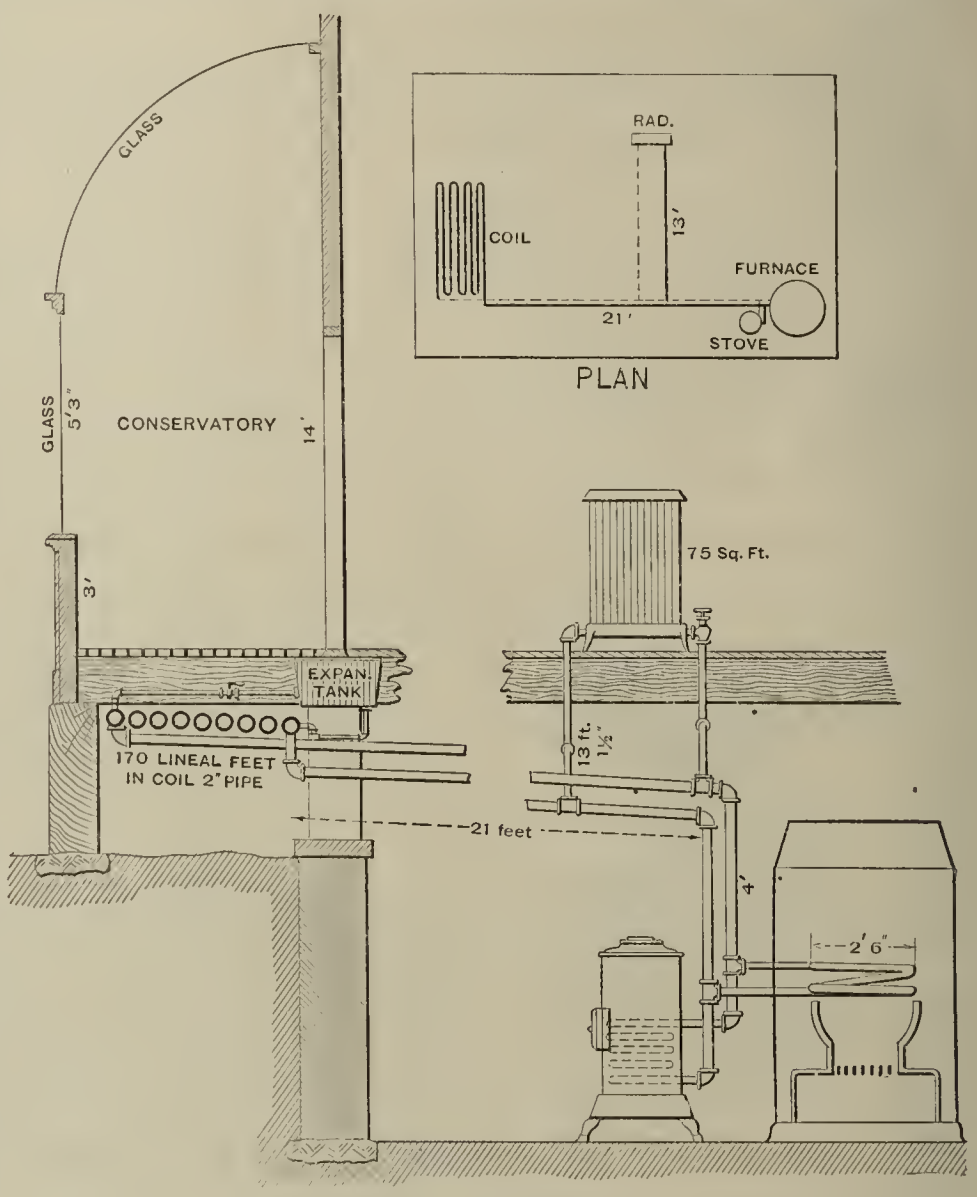
"Then, would a box coil answer, with an ornamental screen and marble top, if necessary?"

"No; could not spare the room."

"Well, then, I am afraid I will have to give it up."

"But you said you could warm this room—what do you mean making all this trouble? If you cannot do it no further argument is necessary."

I went into the cellar and found a window opening into a space about 2½ feet deep under the conservatory floor. I made a flat or gridiron coil, containing 171 lineal feet 2-inch pipe and suspended it from the bottom of the floor joists, giving it an incline sideways, so as to have each pipe a little higher than the one next to it, but kept them level lengthwise. I connected it to the coil in the furnace, putting a drain off cock at the lowest point. I then had the greater part of the floor in the middle of the room taken up, without disturbing the shelves, and relaid it with narrow strips, with ⅛ inch of open space between them. The space between two of the joists I lined with copper for an expansion tank, as I could not put it above the floor, then made a connection from the tank to the return pipe, as shown, putting a trap in it purposely to prevent the tank from getting too hot. When I had that fixed it occurred to me, as such things will pop up when one is on the lookout for them, that some evaporation would be desirable in a room where plants were growing and in house heated by hot air, but this must be made without steam. I therefore made a connection with ½-inch pipe from the highest point of the coil to the tank, 3 inches from the bottom, with a stop cock. This answered two purposes; it relieved the coil of air and caused a circulation between the tank and the coil, which was completely under control, by means of which the water in the tank could be kept just hot enough to evaporate freely, but not make any steam. When the fire was started the arrangement worked very nicely, but I found that the window in the wall between the cellar and the space under the conservatory played a very important part in the apparatus. When kept shut and the fire lively the water in the tank showed an inclination to leave it, and I knew that if it should start it would come out like a Yellowstone Park geyser on a small scale, and if the lady of the house happened to be around she would dismiss us and the heater pretty quick. I left the window open and that pacified the tank. I had a loose cover put on the tank, so that if the geyser did play it would do no harm, and took the window in the cellar out altogether and left the thing to take care of itself.



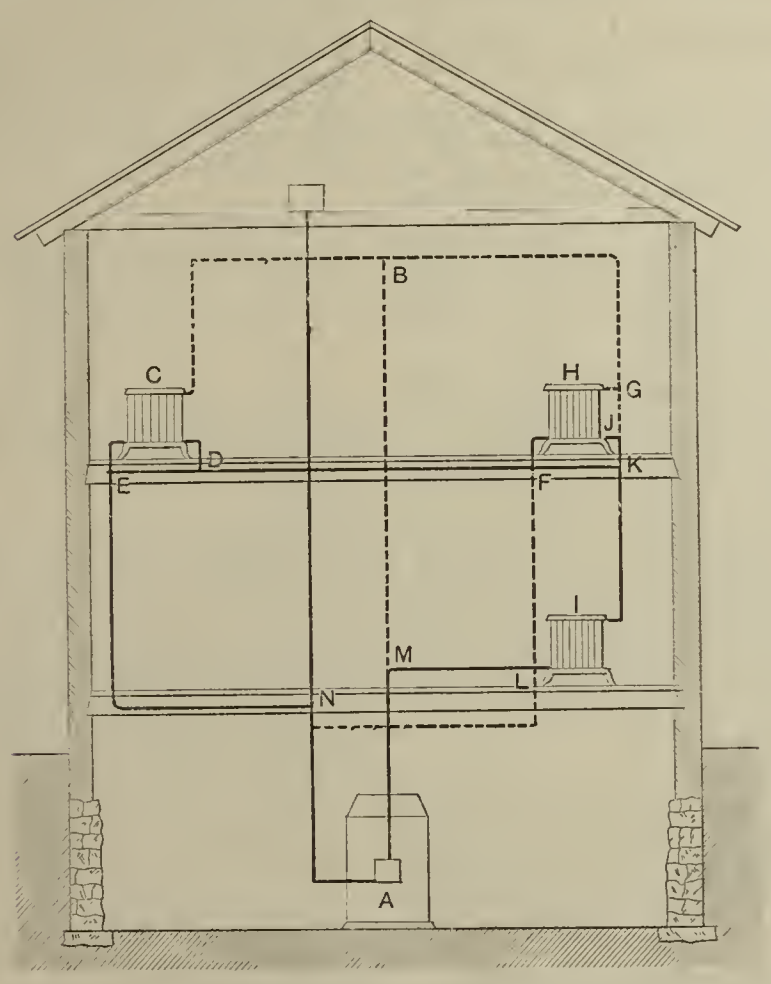
Heating Coils in Furnaces.

This condition of things allowed the cellar air to enter the house through the large door between the conservatory and the sitting room, which was always open, and this was not right; but there was no help, as the furnace got most of its air supply from the cellar, which was clean and dry (that is another peculiarity about cranky women—they will keep things clean). The lady of the house was getting very uneasy about the time it was taking, also the disturbance, and didn't have much confidence in the thing anyway, so I concluded I had better leave, as I did not have much confidence myself. I was afraid of that geyser, but I heard nothing about it until the end of the year, when I met the lady's husband on the street, and he told me as he passed that the heater worked like a charm. I was not quite sure he meant what he said, so I concluded I would settle the point by presenting my bill for the job, and if there was anything wrong I would certainly find it out then. As soon as I entered his office he began to tell what a nice heating arrangement I had put in for him, how long he had tried, and how much money he had spent in trying to warm that side of the house. "It gave him pleasure to pay the bill." Conjure in your mind, if you can, the feeling of a plumber at being spoken to in that way when he presents his bill. It was almost too much for me, and I was not sure but it was sarcasm, until a glance at the check he was making convinced me that it was all right, especially when I remembered that previously he used to do some vigorous kicking. I heard nothing more until three years after. When the natural gas was introduced they put the gas in the furnace without my knowing it. Then for the first time the geyser began to play, proving beyond a doubt that what was just right for coal was all wrong for gas. Of course I had to go and fix it, as they could not possibly get along without it. Some time previous to this they had converted a small room adjoining the sitting room into a toilet room, which they wanted to have heated, and I put a 75-foot radiator in the toilet room (the lady of the house was now willing that I should do as I pleased) and connected it up, as shown, without making any change in the former arrangement; this equalized things again, and they went all right. The next winter they wanted to go away for several months, and did not want to leave the furnace at work, but did not want to have the flowers frozen. I made a small heater by making a spiral coil 25 lineal feet out of 1-inch pipe and put it inside of a sheet iron cylinder, and set it on the base of an old stove, and fitted a gas burner inside of it, and limited the supply of gas to just enough to raise the temperature of the water to 190°.

It has done good service ever since, without any trouble whatever. When you come to see so large a proportion of radiation and so small a portion of heating surface, it may conflict with the rules for calculating the amount of heating surface; but we must bear in mind that every inch of the coil is exposed to the hottest part of the fire, with the flame acting directly on it, and is much more powerful than the average heating surface to be found in boilers and other forms of heaters taken as a whole. It is an old saying that a man's faults travel much faster than his virtues; but give the virtues a good start and they will leave faults in the rear.

After the above job was completed it was spoken of around town, and in a short time I had more of that kind of work than I could attend to. A large portion of it I could not do, even if I had had time, as my customers appeared to think there should be no limit to the thing, one man wanting a chicken house that stood about 50 feet from and 15 feet below the kitchen heated from the water back in the kitchen stove, and thought it strange that I did not want to do it. If this experience will be of any use in forming a rule your readers are welcome to it.

I think you will not find any rule that will take the place of experience. If we could make some rule by which we could get over the unreasonable demands and objections of whimsical women, and men as well, it would be a great benefit to the trade; but I fear this problem will be far more difficult to solve than the first one.



Heating Radiators from Furnace.

Heating Radiators from Furnace.

From C. L., *Baltimore.*—Will the system shown by the sketch give a good circulation of hot water from a furnace containing a boiler 12 x 24 inches with 1 inch supply? I shall be glad to receive any suggestions.

Note.—Our correspondent asks for assistance, and any suggestions from our readers will be welcome. In our opinion the system shown by the solid lines would not prove satisfactory. A better plan would be to run a 1½ inch pipe from the boiler A directly to B, as shown by the dotted lines, taking a 1 inch branch over to the radiator C and returning from the radiator to the boiler, taking out the pipes D, and the horizontal pipe from E to K. From B take a 1¼ inch branch to G, taking a 1-inch connection to the radiator H, and reducing the pipe to 1 inch and continuing to the radiator I. From the radiator H bring a 1 inch return to L, where a 1-inch connection should be made to radiator I, and the return increased to 1¼ inches and taken over to N, where the return should increase to 1½ inches and return to the furnace boiler A. A 1-inch pipe should run from N up to the expansion tank. An air valve should be placed at B, which should be made the highest point of the system. The pipe from M to L should be taken out.

Location of Expansion Tank.

From REX, *Rochester, N. Y.*—In reply to the inquiry of "M. K." in *The Metal Worker*, March 31, the expansion tank should in all cases be placed on the highest line that the radiators are placed on, and connected both to the return and flow pipes, so that there will be a circulation through the expansion tank at all times. By doing this it will avoid any snapping and cracking in the heating pipes and also prevent the emptying of the boiler, if connected to same, through careless firing. By connecting the expansion tank as above stated, the tank can be placed in a colder place, such as attics, and a large vent pipe be run to some suitable point. So connected it is not very apt to freeze up and burst the boiler, as the writer has seen in a number of cases with the single connection.

T. C. JOY & Co., Titusville, Pa., manufacturers of the Joy steam and hot water heaters and radiators, recently made a slight reduction in wages, which was accepted by all their employees, with the exception of the molders. The firm

do not anticipate any serious trouble and expect to be running with a full complement of men within a week or ten days.

HEATING NOTES.

SECRETARY GEO. H. REYNOLDS informs us that the headquarters of the Master Steam and Hot Water Fitters' Association of the United States will be transferred to the Broadway Central Hotel, New York City, May 1, and that all communications should be sent to that address after that date. This is the hotel that has been selected for holding the national convention June 19 to 21, and Secretary Reynolds will be found there up to that time.

WM. M. BARBER, heating engineer of the Smith & Anthony Company, Boston, Mass., made a visit to the New York house at 54 Beekman street, recently. Mr. Barber drew the plans for the Model School that were sent to the World's Fair by Chief Wade of the Massachusetts State Board of Inspectors.

GEO. P. JACOBS & COMPANY, Brooklyn, N. Y., who make a specialty of supplies for steam and gas fitters and plumbers, are sending out a very convenient desk blotting pad. Cutting and threading pipe to specifications up to 10 inches in diameter occupies one department of their business and heating by either exhaust or live steam another.

THE PENN ENGINEERING COMPANY, 312 Cherry street, Philadelphia, are putting on the market a ball joint pipe hanger which they claim will swing in any direction that the pipe expands and is easily adjusted.

THE A. A. GRIFFING IRON COMPANY, Frank Somers agent, will remove their Chicago office from 88 Lake street to 34 Dearborn street.

THE RINGEN STOVE COMPANY, St. Louis, have just completed what is considered one of the largest hot water heating contracts in the West, at the St. Joseph Orphan Asylum, St. Louis, Mo. There are about 18,000 feet of radiation in the building connected with a battery of two 5 x 18 foot boilers which contain each 72 lap welded boiler tubes 4 inches in diameter and 18 feet long. It was deemed advisable to place the boiler at a distance from the building for safety sake, and therefore a large tunnel had to be built purposely for the accommodation of the flow and return pipes for this heating construction. The boiler houses are 120 feet west of the asylum. In the tunnel are laid two 15-inch hot water flow and return mains, through which all water passes.

A. A. GRIFFING IRON COMPANY, 15 Dey street, New York, have been made the Eastern agents for the Powers regulators, made by the Powers Duplex Regulator Company of Chicago. They have just closed a contract for their introduction in the schools of Long Island City, where they will be used for regulating the dampers in the air ducts as well as for controlling the fire. One of their new things displayed in their window is the Princess radiator, which is of the flue type, handsomely decorated.

THE BARRON STEAM HEATING COMPANY have a fine office in the Cable Building, at Broadway and Houston street, New York, where they have just moved.

PURSUANT on the death of Arad T. Foster, president of the Haydenville Mfg. Company, 73 Beekman street, New York, a meeting of the directors was held on April 5 to elect new officers. H. H. Beals, treasurer and secretary of the company, was elected president and general manager, retaining also his office as treasurer. Cuyler K. Sanborn, lately vice-president, was elected vice president and secretary. No changes will be made in the policy of the firm, which will continue to be carried out on the lines laid down by their late president.

T. C. JOY & Co., manufacturers of the Joy steam and hot water heaters and radiators, have moved their Chicago office to 82 Lake street.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE PLUMBING CONTRACT, amounting to $4496, for the new post office at Lowell, Mass., is reported to have been let to the Dalton Company of Chicago.

A. V. FETTER, La Crosse, Wis., has been awarded the contracts for plumbing the new opera house at Stevens Point and also large buildings at Medford and Marshfield.

THE JAMES STEAM HEATING COMPANY, 109 South Sixth street, Brooklyn, are engaged in remodeling the steam heating plant in the carriage factory of R. M. Stivers & Co., New York.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until May 1 for the interior finish and plumbing of the United States Court House and Post Office building at Sioux Falls, S. Dak. Drawings and specifications may be had from the Supervising Architect, Washington, or from the superintendent at Sioux Falls.

THE SMITH & ANTHONY COMPANY, Boston, Mass., are installing the heating plant in the High School building at Arlington, Mass. It is on the blower system with fan, two water tube boilers and the equivalent of 6000 feet of radiation.

BIDS will be received by the Board of Education of Cincinnati, Ohio, up to April 16, for the heating and ventilating and a system of flush closets for an eight-room school building.

E. C. WORRELL, Moorestown, N. J., will install a steam heating plant and do the plumbing work in the new residence of Samuel L. Allen, at Stanwick.

THE CONTRACT for plumbing the Wachusett House, at Princeton, Mass., has been awarded to Wm. F. Tucker of Worcester.

THE THEO. JACOBS COMPANY, 72–74 Market street, Chicago, have contracted to furnish new boilers and heaters for the building occupied by the Columbus clothing store, State and Monroe streets.

E. BAGGOT, 169–171 Adams street, Chicago, has taken the contract for the plumbing and sewerage in the Garfield Building, Euclid avenue and Bond street, Cleveland, Ohio.

THE J. L. MOTT IRON WORKS, 311–313 Wabash avenue, Chicago, have received orders for two Sunray hot water heaters from Los Angeles, Cal.

COOK & CHICK, 253–255 Kinzie street, Chicago, are to install steam heating plants in the flat building of Mrs. M. A. Roth, Jackson Boulevard, near Troy street, and in the flat building of George Bloom, Lawndale avenue.

RING & REARDON, 3841 Finney avenue, St. Louis, have installed a number of Sunray hot water heaters and received orders for six more.

J. F. CONNELL, 687 West Indiana street, Chicago, has contracts for the plumbing and gas fitting in the residence of A. B. Campbell, 378 Hoyne avenue; flat building of J. B. Nash, 648 West Erie street, and residence of B. Byan, 840 West Chicago avenue.

THE CONTRACT for heating and ventilating the new and old prison buildings and warden's residence at Norristown, Pa., has been awarded to the Penn Engineering Company, 312 Cherry street, Philadelphia. The bids were opened in the presence of the bidders and ranged from $4283 to $6031. The amount of the Penn Company's bid was $5210. Edwin F. Bertolette of Norristown, is the architect, and the bids were made upon specifications prepared by him.

J. SIDNEY VILLERE & Co. have designed for Miss Etta R Gregory a three-story apartment building to be erected at 16 and 18 St. James place, Chicago, at a cost of $18,000, which will be heated from a hot water plant.

BABB, WITHAM & KELLEY, the plumbers and steam heaters, are installing a steam heating plant in St. Mary's Parochial School, at Bangor, Maine.

DILWORTH CARTER is building a $6000 residence at Astoria, Ill., which is to be heated by steam or hot water, for which estimates are desired.

D. H. KELLY has secured the contract for the plumbing and steam fitting for the new factory of the Williams Typewriter Company, at Derby, Conn.

BIDS will be received until April 16 for the plumbing, gas fitting, heating and ventilating of a High School building to be erected at Lincoln, Neb.

THE S. WILKS MFG. COMPANY, 113 Clinton street, Chicago, have shipped four of their heaters to the Rider Heating Company, Helena, Mont.

FOSTER & GLIDDEN, general agents for the Farquhar Heating Company, 58 Dearborn street, Chicago, report the following contracts: Hot water heating in the residence of D. N. Hanson, Forty-eighth street and Ellis avenue, and residence of A. B. Smillie, Norwood Park, Ill., steam heating in Park Home Hotel, Blue Island, Ill., and combination heating in residence of F. P. Bagley, Hinsdale, Ill.

A petition signed by 830 captains of British ships navigating the North Atlantic, commanding a gross tonnage of nearly 2,000,000, and representing crews of about 30,000 men and capital of $150,000,000, has been forwarded to the British Government, praying them to make prompt co-operation with the United States Government in destroying ocean derelicts, which constitute a great danger to life and property on the Atlantic.

The Russo-German commercial treaty, recently arranged after much opposition, went into operation on the 20th inst. It is to remain in force for 10 years.

PLUMBING and GAS FITTING.

Pratt Institute Graduates in Plumbing.

On the evening of March 23 a committee of the Journeymen Plumbers' Association of Brooklyn visited the trade school of the Pratt Institute, and held an examination of the plumbing class, with the view of awarding certificates to those students who had completed the prescribed course of study. The examination included an inspection of the work of the candidates and questions by the Examining Committee, which covered a thorough knowledge of methods and work, together with the sanitary and scientific conditions underlying the subject.

Certificates were awarded to six students—namely:

J. S. Wright,
L. Calahan,
J. J. Heilman,
J. Munk,
A. L. Maxwell,
C. B. Kineo,

all of Brooklyn. The committee were accompanied by three master plumbers, who expressed themselves warmly in regard to the progress and efficiency of the class.

These certificates were for the first time, under the new arrangement, granted by the Board of Directors of the Journeymen Plumbers and Steam and Gas Fitters' Helpers of L. U. No. 1. They were countersigned by the trustees of the institute. The institute no longer grants certificates to the evening classes.

Trouble Among Chicago Plumbers.

The Chicago plumbers have decided to strike unless their employers agree to pay the same wages during 1894 that were paid last year. The journeymen plumbers have submitted to the employers individually an agreement, of which the following is a copy:

Agreement entered into between the undersigned employing plumbers and the Chicago Journeymen Plumbers' Protective and Benevolent Association:

SECTION 1. That the hours of labor shall be from 8 a.m. until 5 p.m., with one hour for dinner, and on Saturday from 8 a.m. to 4 p.m., with one hour for dinner, excepting the Saturdays from June 15 to September 15, when the hours of labor shall be from 8 a.m to 12 m.

SEC. 2. That wages shall be $3.75 per day, excepting the Saturdays between June 15 and September 15, for which they shall be $2.25.

SEC. 3. That wages are due and payable when work ceases on Saturdays.

SEC. 4. All Sunday, New Year's, Christmas, Fourth of July, Thanksgiving and overtime work shall be paid for at the rate of double time.

SEC. 5. That members working outside the city of Chicago shall be subject to all the conditions of this agreement, and in addition thereto shall have their board and railroad tickets furnished; traveling time paid at the rate of regular time; when traveling at night sleeper to be furnished where the distance is more than 100 miles; no charge for time traveling at night; Sunday traveling to be paid at single time.

SEC. 6. That sections 1, 3, 4 and 11 of this agreement shall also govern the junior plumbers.

SEC. 7. That all men shall be held responsible for incompetent work when it is due to their negligence and other causes directly traceable to their carelessness and incompetency.

SEC. 8. That whenever a question shall arise between the employing plumber and the employee in regard to inferior work done by said employee, and said question cannot be settled by said parties, then an Arbitration Committee shall be appointed consisting of two plumbers, one to be selected by the employing plumber and the other by the Journeymen Plumbers' Protective and Benevolent Association, and in case said committee of two cannot agree, then said committee shall select a third party, and the decision of the majority of said committee of three shall be final and binding upon both parties.

SEC. 9. That no more than one helper shall be allowed for every three journeymen plumbers working in a shop.

SEC. 10. When more than one man is required on a job it must be under the supervision of a journeymen plumber.

SEC. 11. A sympathetic strike, when ordered by the Building Trades' Council, will not be a violation of this agreement.

SEC. 12. That this agreement shall continue for the space of two years, beginning on the first day of April, 1894, and ending on the first day of April, 1896.

SEC. 13. That in case the parties to these presents shall desire to enter into a further agreement at the expiration of this agreement, then said agreement shall be made by and between said parties at least three months previous to the expiration of the present agreement.

In witness whereof the parties to these presents have hereunto set their hands and seals.

....Name.

.. .. Address.

CHICAGO JOURNEYMEN PLUMBERS' PROTECTIVE AND BENEVOLENT ASSOCIATION.

By .....

The agreement submitted by the Master Plumbers' Association to the union contains the following clauses to which strong objections are made by the men:

That wages shall be $3 per day excepting the Saturdays between July 15 and September 15, for which they shall be $1.50.

That the members of the Chicago Journeymen Plumbers' Association will be responsible for their work, for their incompetency, and that said association shall be responsible for said incompetency.

That this agreement shall continue until December 31, 1895.

That journeymen plumbers furnish their own furnaces.

A large and enthusiastic meeting was held by the Chicago master plumbers, at their hall, 197 Madison street, on Monday afternoon. April 2. The unanimous opinion of those present was that some of the demands made by the Journeymen's Protective and Benevolent Association were unjust.

A large number of the master plumbers who were interviewed criticised the proposed journeymen's agreement as follows:

Sec. 2. The reason the full amount of wages was not conceded was that many investors, having plans prepared, and comparing them with like plans executed during the World's Fair season, discovered that there was not sufficient difference in the estimates offered as compared with the general decline in the price of material, and have not, therefore, entered into the construction of the buildings intended.

Sec. 4. Regarding this section, only time and a half should be paid for overtime between 5 p.m. and 12 m.

Sec. 5. Objected to.

Sec. 8. We do not know what value the agreement would be to us if section 8 was adopted.

Sec. 9. The helper question should be regulated by the Master Plumbers' Association.

Sec. 10. Superintendents of work should always be at the discretion of the employer.

The journeymen plumbers claim that they have already secured a number of signatures of employers to their proposed agreement, but the Master Plumbers' Association assert that those who have signed are only master plumbers running small shops and employing very few men.

TRAPS AND VENTS.

THE BOARD OF HEALTH of Norfolk, Va., have recommended an ordinance to the City Council for adoption that was prepared by a joint committee of master and journeymen plumbers.

THE FOLDING BATHTUB COMPANY, Marshall, Mich., send out colored circulars calling attention to the folding bathtubs of their manufacture. In addition to these specialties the firm also make stationary bathtubs, bath heaters, sanitary bath chairs, clothes hampers, combination commodes, &c.

SAMUEL DAVIDSON of the Steel Clad Bath Mfg. Company, New York, is on a trip through the South explaining that the Steel Clad bath has all the advantages of the wood copper lined bath and all of the advantages also of an exposed plumbing fixture.

The Metol Worker is indebted to Plumbing Inspector Wm. Lunn of Memphis, Tenn., for a copy of the plumbing ordinance recently passed by that city. In a letter inclosing the ordinance he says: "Our sewer system is of the G. E. Waring design, and in many places very near the surface. A large amount of our laterals from the 20-inch main are 6-inch pipe with 4 inch house connections, and each lateral has a great many house connections. The system gives general satisfaction." With a loyal pride he adds, "I will also state that our plumbing will compare favorably with that of any other city".

MARK R. DAYKIN of the plumbing firm of Daykin Bros., Cleveland, Ohio, is a candidate for the School Council of his city at the spring election.

THE BOARD OF HEALTH of Sacramento, Cal., have elected G. W. Horr sanitary and building inspector and Victor J. Talley plumbing inspector.

THROUGH AN ERROR a plumbing ordinance of New Haven, Conn., omits the word "iron" after the words "extra heavy," relating to drain pipes. As a result a spirited contest has waged between a sewer contractor and the

mayor, which will end in the ordinance being amended.

MURRAY & MAHER, New London, Conn., have moved their plumbing and tin shop to 15 Main street.

DEDHAM, MASS., has under consideration a system of plumbing regulations.

JACKSONVILLE, FLA , has passed an ordinance of 15 sections remodeling the plumbing ordinance of 1889. The plumbers will now have to pass an examination and do their work on the approved modern plan.

THE MASTER PLUMBERS' ASSOCIATION of Newark, N. J., have made application for membership in the National Association of Master Plumbers, so we are informed by Secretary Don.

THE NEW YORK TRADE SCHOOL will continue the day class in plumbing, beginning April 9, until April 28, for the benefit of such pupils as desire more practice.

THE COURT OF SPECIAL SESSIONS of New York City last Monday inflicted a fine of $10 on a First avenue plumber who was doing work in violation of the law requiring a certificate of competency and a license. Several other cases are before the court for trial.

MANCHESTER, N. H., has a new set of plumbing regulations of 24 sections.

WIDDOS & SHANEBERGER have opened a plumbing establishment at 459 Northampton street, Easton, Pa.

MACON, GA , is to have a system of sewers, amounting to a length of 42 miles. Gabourg & Noble, Anniston, Ala., have the contract at $100,000.

J. W. CHAMBERLAIN & Co , plumbers, have been incorporated, at Bangor, Maine. Joseph W. Chamberlain is president of the new concern and Joseph E. Chamberlain treasurer.

THE DETROIT MASTER PLUMBERS' ASSOCIATION held a reception and ball at Clawson's Hall, 96 Miami avenue, Detroit, on the evening of the 4th inst.

GRANT CRITTENDEN, Pekin, Ill., has taken a partnership with Henry Hurkett in his plumbing business.

ARTHUR SHEA, Rockland, Maine, has been making extensive improvements in his plumbing shop in the Glover & Ames Building in that city, where he has been located for the past 12 years.

JOHN C. C. BOHLMAN & Co. is a new plumbing concern that has gone into business at Pittsfield, Mass.

SMITH & WEBSTER, 193 Lake street, Chicago, have moved their plumbers' supply factory to 15 to 21 North Clinton street. The show-room will remain at 193 Lake street until May 1, when a more central location will be secured.

GEORGE FISH is arranging to open a plumbing establishment in the Schlosser Building on Ferry street, Albany, Ore.

A. G. HALE AND L. W. THURSTON, both lately with L. E Smith & Co., have formed a partnership and will conduct a general plumbing business under the firm name of J. P. Hale & Co. at the store 12 Short street, Gloucester, Mass., formerly occupied by Richard Tufts. They will carry a stock of stoves, furnaces and plumbers' materials, and will pay special attention to tin roofing, pump and vessel work in addition to sanitary plumbing, ventilation and house drainage.

FLASHINGS.

A COMPANY, under the style of the Baker Red Slate Company of Troy, N. Y., have been incorporated by Troy capitalists to quarry slate at North Granville, N. Y., with a capital of $100,000.

MOST OF THE SLATE WORKERS in the Bangor and Pen Argyl district, Pa., struck this week against a reduction of wages recently put into effect. The men are now paid from 85 cents to $1.25 a square, but demand a return to the old scale. It is thought that there will be a general cessation of work in the quarries until the question is settled. The slate industry is just reviving after several months' slackness, and the quarries were running at their fullest capacity.

AS AN EVIDENCE of reviving activity in the building industry the large shipments of roofing slate made by the Slatington-Bangor Syndicate in the month of March are significant. They were much above those of January and February and beat all previous March records. The shipments were in 90 carloads, comprising 4341 squares, and were sent all over the United States east of the Rocky Mountains. The syndicate is said to have orders booked for the season for 25,000 squares, and they regard the outlook for the slate trade in the present year as being remarkably good.

MARLIN & Co., Incorporated, Allegheny, Pa., manufacturers of eave troughs and water conductors, have recently added considerable machinery to their equipment and are now prepared to furnish a full line of round and corrugated water conductors in 10-foot lengths. Included in the new machinery added by this firm is a 10-foot power squaring shear, also a forming machine for making eave troughs up to 10 feet in length. For some time past this firm have been working on large orders for galvanized iron cans, to be used for freezing artificial ice. Orders for these cans have been received from artificial ice makers in Philadelphia, Pa., Louisville, Ky., Massilon, Ohio, and other points. The business of Marlin & Co., Incorporated, was established in the present location in Allegheny, Pa., a few years ago under the name of Armor, Marlin & Co., and later changed to Marlin & Co., and finally to Marlin & Co., Incorporated, and has grown very rapidly. Their trade for last year was considerably larger than for any year in their history, notwithstanding the general depression in business. At this time the firm are fully occupied in turning out their various products, and are giving employment to a large force of men.

THE iron and steel roofers of Ohio have apparently found bottom on prices and are now getting down to business. Orders are reported more plentiful and the general appearances of activity at the various factories are more satisfactory. Nearly all the roofing and corrugating concerns of Ohio have now become extensive users of galvanized sheets and report increased demand for that class of goods.

THE AMERICAN ROOFING COMPANY, St. Louis and Cincinnati, report an improved trade, which has enabled them to equal their March business of last year. The outlook for the present month is excellent, and unless something unforeseen occurs they expect to also equal their April record of last year. They report a good demand for gutters, conductor pipes, elbows, &c. They have just issued a new catalogue relating to these goods, which is now being mailed to the trade.

OBITUARY.

WILSON C. BERGER.

Wilson C. Berger, superintendent of the Berger Mfg. Company, Canton, Ohio, died April 2 after an illness of three weeks. Mr. Berger was born in Millersburg, Pa., 43 years ago. While he was a boy, but 19 years of age, he went to Canton and has resided there ever since, always taking an active part in business and charitable enterprises. In 1872 Mr. Berger married Miss Mary Myers, who with a daughter and two sons survive him. Mr. Berger was a solid and experienced business man and very popular among his employees and friends. His name has become prominent in manufacturing industries, and the business with which he was connected has prospered under his skillful and conscientious management.

JOHN WILKESON.

The death is announced, on April 4, of John Wilkeson, one of the oldest and best known citizens of Buffalo, at the age of 88. Mr. Wilkeson, who was born at Poland, Ohio, was in his earlier days a prolific inventor, and held many patents on stoves and heaters. With his father and brothers he was largely engaged in the iron business in Western New York and Ohio. Later he became interested in the timber and elevating business. He saw active service during the war, in which one of his sons was killed.

ARAD T. FOSTER.

We regret to announce the sudden death, at his home in Brooklyn, on March 30, of Arad T. Foster, president of the Haydenville Mfg. Company and vice-president of the Peck Bros. Mfg. Company of this city. We will give a fuller notice of Mr. Foster in a later issue.

Milk Can for Mule Back.

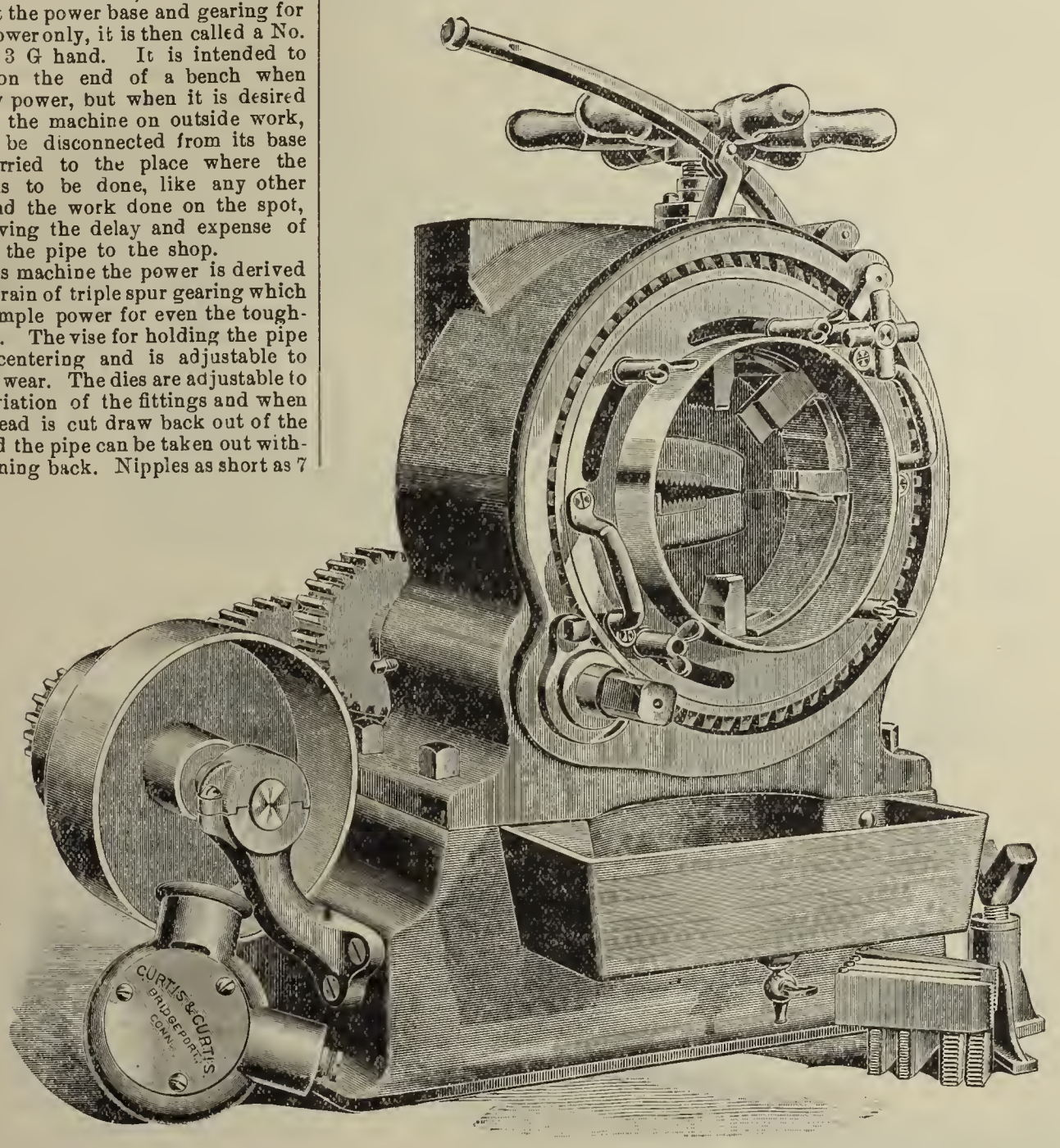
Iron Clad Mfg. Company, 22-24 Cliff street, New York, are manufacturing a novel milk can for fastening on each side of a mule for transportation in mountainous sections. These are sent principally to South American countries, where the milk dealer serves his customers by this method instead of using a horse and wagon, as with us. The can is 21 inches high, 19 inches long and 9 inches through. The top and bottom are round, while the center on both sides is slightly concave, to fit the mule's sides. They are made in three capacities, 5, 8 and 10 gallons. The material is No. 20 gauge sheet steel, tinned. In the center of the top is a 5-inch round opening, so made as to be absolutely tight, the cover being fitted with a lever and rubber gasket, the whole contrivance projecting about 2 inches above the top of the can. The sides extend ¾ inch beyond both ends. On the top are two milk can handles, while the bottom has one.

Indications in the Lake Superior region point to the earliest opening of navigation on record. Everything of this character helps in the revival of business and in the employment of men who have long been idle.

New Form of Forbes Die Stock.

Curtis & Curtis of Bridgeport, Conn., have just brought out a new development of the Forbes patent die stock, which is here illustrated. It is operated by hand or power and is designed to cut off and thread, right hand, all sizes of wrought iron pipe from 1 to 6 inches inclusive. When this same machine is supplied with both right and left hand dies, it is then called a No. 3 G power machine, and when made without the power base and gearing for hand power only, it is then called a No. 3 F or 3 G hand. It is intended to stand on the end of a bench when used by power, but when it is desired to use the machine on outside work, it can be disconnected from its base and carried to the place where the work is to be done, like any other tool, and the work done on the spot, thus saving the delay and expense of carting the pipe to the shop.

In this machine the power is derived from a train of triple spur gearing which gives ample power for even the toughest pipe. The vise for holding the pipe is self centering and is adjustable to take up wear. The dies are adjustable to any variation of the fittings and when the thread is cut draw back out of the way and the pipe can be taken out without running back. Nipples as short as 7 inches can be made without a nipple holder, and with the aid of the Curtis nipple holder, manufactured by this firm, short or close nipples can be made.



New Form of Forbes Die Stock.

Argentina's condition is regarded as very promising. Official reports show that the country during 1893 maintained a steady recovery from the depression of previous years. Immigrants numbered 110,226, while the departures were only 64,100, leaving a balance of 46,126 in favor of the republic.

Yet another ship canal is about to be undertaken on this continent. Last week the Ontario Legislature granted a franchise incorporating the Hurontario Ship Canal Company and empowered it to have one terminal point on Lake Ontario, near Toronto, and another on Georgian Bay, near Collingwood. This canal will, it is claimed, shorten the route from the West to Liverpool by 800 miles. The capital stock of the company is placed at $65,000,000, and a number of American capitalists are said to be interested in the scheme.

According to the *Labor Gazette* of London, labor disputes in England last year involved 602,668 persons. Of these strikers 390,844 were successful and 134,864 were partially successful, while 68,934 were unsuccessful, and the results were not known in the cases of 8026. The figures for 1893 are of unusual interest, since they embrace the results of the Lancashire cotton strike early in the year and the great coal strike in the summer and fall. The latter dispute is included among the "successful" ones, which accounts for the large figures under that heading.

Among the companies recently incorporated according to the laws of the State of New York is the New York & Chicago Ferris Wheel Company of New York. With a capital of $600,000 the concern will manufacture and exhibit wheels of the Ferris type, constructed for purposes of observation and amusement. The directors are named as follows: Geo. W. G. Ferris of Pittsburgh, Andrew Onderdonk of Chicago, and F. L Marshall, Anson Maltby and Wm. G. Russey of New York City.

M. Bartissol's scheme for the carrying out of the Panama Canal project is said to include a plan for the cutting of a stone tunnel some six miles long through the high level of the canal. Into this the Chagres River is to be turned, and through sluices it is to be discharged into the excavated earth, the force of the stream being counted on to carry the earth off to the Pacific Ocean. Owing to the liability of the river to swell dangerously during freshets, the plan is, however, regarded by some engineers as impracticable.

Experts assert that the passage of the new ship canal across the Isthmus of Corinth is not without possible danger to steam vessels. At certain points, it is said, the danger of a landslip, notwithstanding all precautions, is not excluded. It is believed that the larger portion of the traffic through the canal will be composed of sailing vessels.

J. Stub has opened a tin shop at Brownsfield, Maine.

THE TIN SHOP.

Pattern for Four-Piece Elbow.

From L. A., *New York.*—I would like to have a method published in *The Metal Worker* for describing the pattern of a four-piece elbow.

Answer.—In Fig. 1, let *e f g h* represent a cylinder cut by planes oblique to its axis, as shown by *o o'*, *p p'* and *q q'*. An inspection of the figure will show that the angle *e o o'* is similar to the other like angles, as *o o' p'*, *p' p q* and *q q' g*. If these sections A, B, C, D were placed together as shown by A*a* B*a* C*a* D*a* in Fig. 2, a four-piece elbow would be the result. In Fig. 3 the elevation of a four-piece elbow, similar to that in Fig. 2, is shown in connection with the profile and half pattern. To obtain the elevation, draw the square J K L M, and from J as center strike the arc M P K. Also draw J L. Divide the eighth of a circle M P into one less number of parts than there are to be pieces in the elbow, and as in the present instance there are to be four, M P is to be divided into three equal parts, as indicated by the small figures in M P. From the first division, as O, draw O J. Make K Q equal to M O, and draw Q J. From O drop the perpendicular O G, and from the point N set off the diameter of elbow, as shown by N *n*. Through point *n* draw E *o* parallel with G O, and also draw E G parallel with J M. With *x* as center strike the profile E F G H, and divide E F G into any convenient number of equal parts. From the points thus obtained erect perpendiculars, cutting the miter line O J, as shown. Connect the points O P, P Q, and draw Q R parallel with L K. Make J *p* and J *q* equal to J *o*, and draw *o p*, *p q*. Also draw *q r* parallel with Q R. Then R Q P O N *n o* *p q r* is the elevation of a four-piece elbow.

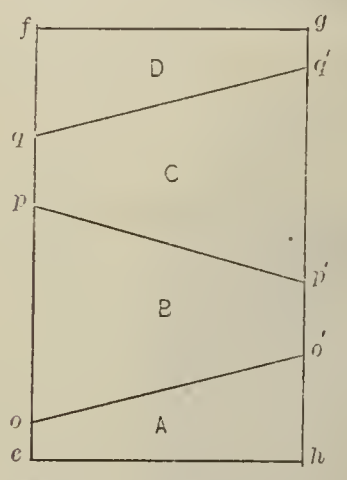


Fig. 1.—Elevation of Cylinder from which Sections are Obtained.

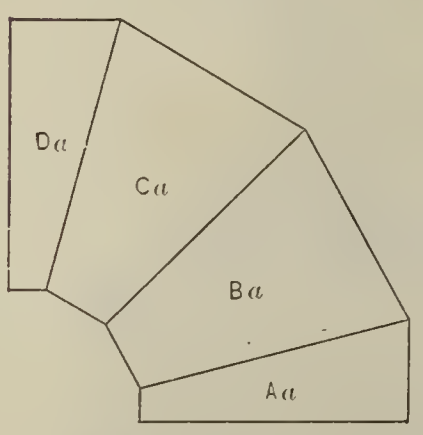


Fig. 2.—Sections Placed Together so as to Form an Elbow.

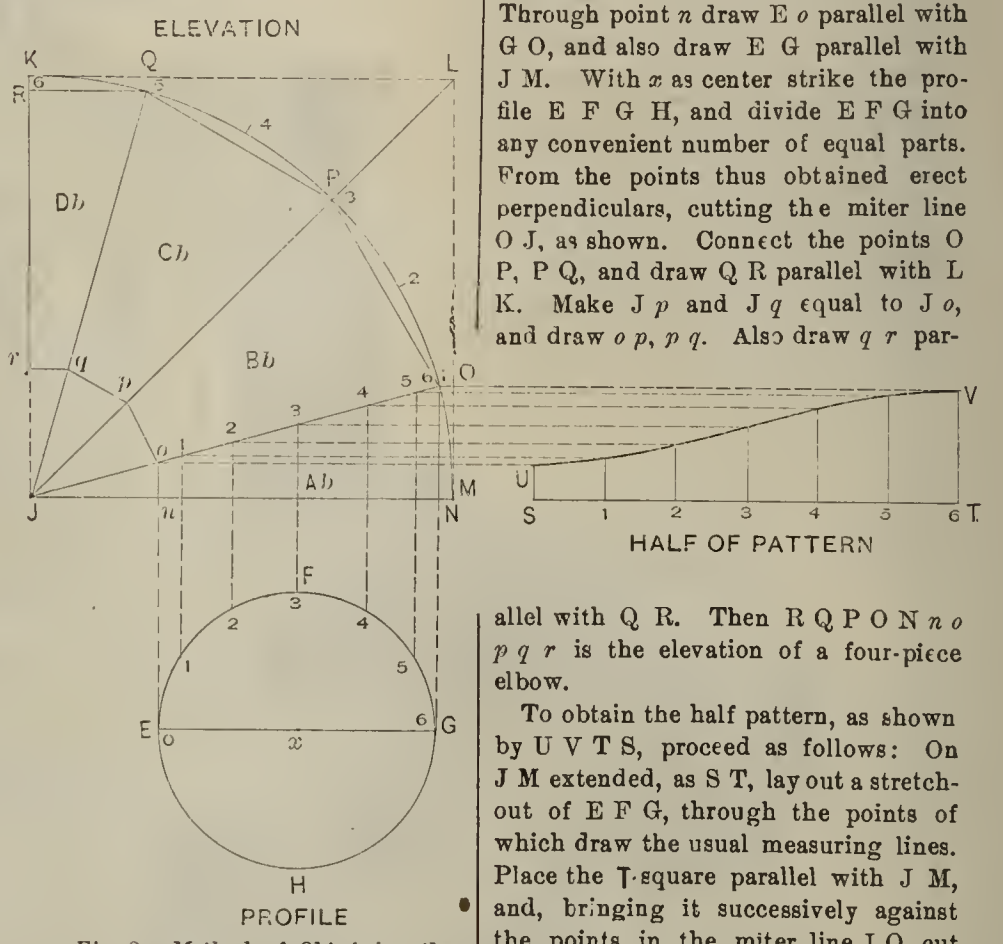


Fig. 3.—Method of Obtaining the Half Pattern.

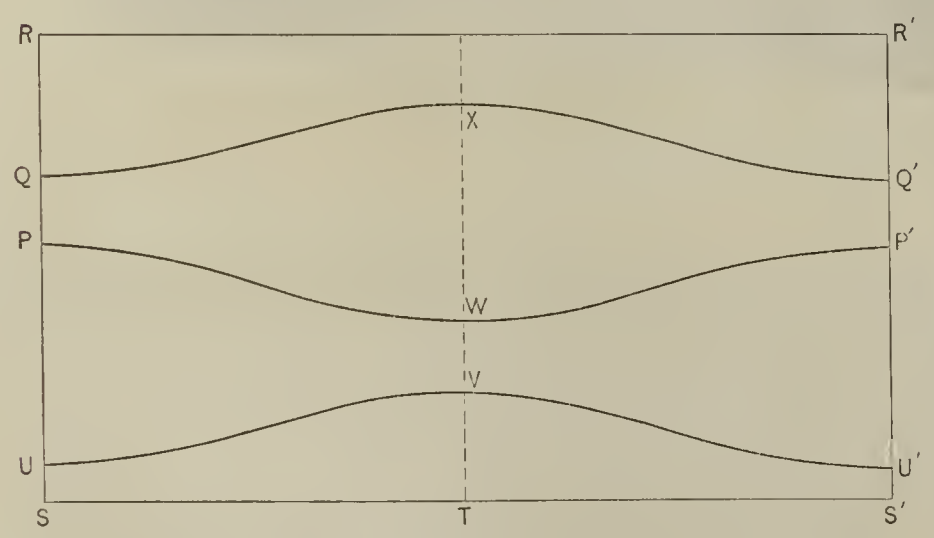


Fig. 4.—Half Pattern Used for Obtaining Pattern of Whole Elbow.

PATTERN FOR FOUR-PIECE ELBOW.

To obtain the half pattern, as shown by U V T S, proceed as follows: On J M extended, as S T, lay out a stretch-out of E F G, through the points of which draw the usual measuring lines. Place the T-square parallel with J M, and, bringing it successively against the points in the miter line J O, cut the corresponding measuring lines. A line traced through the points thus obtained, as shown by U V T S, will form the half pattern of part of elbow shown in elevation by O N *n o*, or in profile by E F G. It will be observed that only part of the elevation has been used for obtaining the half pattern, which was derived from the miter line J O in connection with the profile E F G H. In practice it is only necessary to draw the half profile E F G, and above, and in line with same, the right angle J M L, making M J and M L the same length. Connect J L, and with J as center strike the arc M P, which is the eighth of a circle. Divide M P into one less number of parts than there are to be pieces in the elbow, and from the first of these divisions, as O, draw the miter line J O. The pattern is then to be obtained as previously described. The entire pattern of elbow, as shown in Fig. 4 by R R' S S', can be obtained by the use of the half pattern U V T S, as follows: On the line S S' lay the half pattern and mark about it as shown by U V T S. Re-

verse the pattern and mark T V U′ S′. From S and S′ erect the perpendiculars S R and S′ R′. Make U P and U′ P′ of pattern equal to O P of elevation, and also make V W of pattern equal to *o p* of elevation. By using the pattern as previously described, draw P W and W P′. Q X Q′ can be drawn in a similar manner. Make S R and S′ R′ equal and draw R R′. The usual allowances for joining to be made on S R and S′ R′.

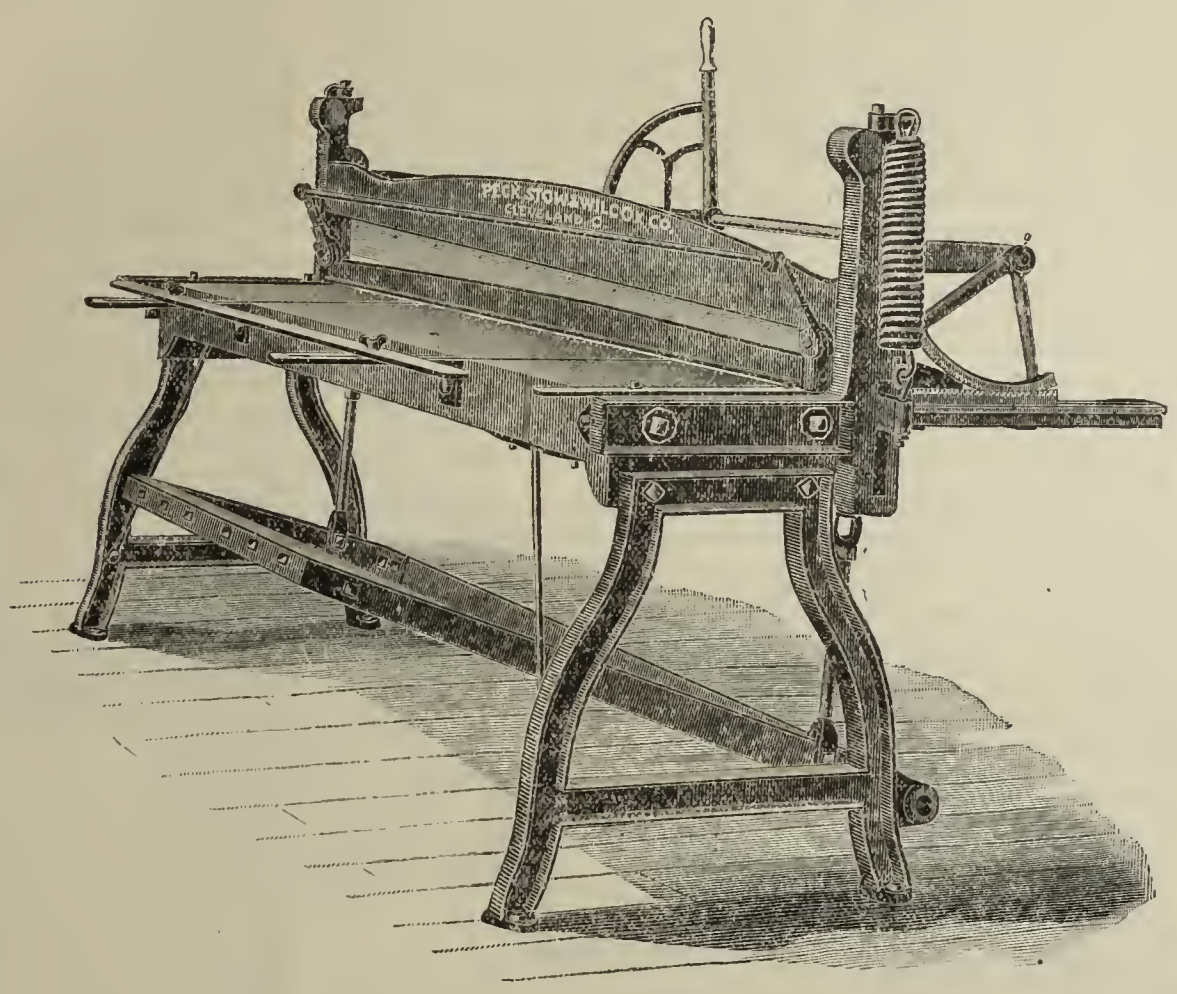
Cornice Makers' Squaring Shear.

Peck, Stow & Wilcox Company, Cleveland, Ohio, and 27 Chambers street, New York, are introducing an improved cornice makers' squaring shear, as here shown. This shear is brought out principally for the use of cornice makers and is supplementary to an extensive line of squaring shears made by this concern. It has a hold down attachment and gauges for squaring and cutting at angles, with a lever on graduated arc for working the back gauge with gear and rack from the front of the shear. The arc has a scale up to 27 inches, showing fractions of an inch, and by means of this device the gauge can be set at any point instantly, without leaving the front of the machine. The shear is made in but one size, 97 inches, and is warranted to cut No. 22 iron.

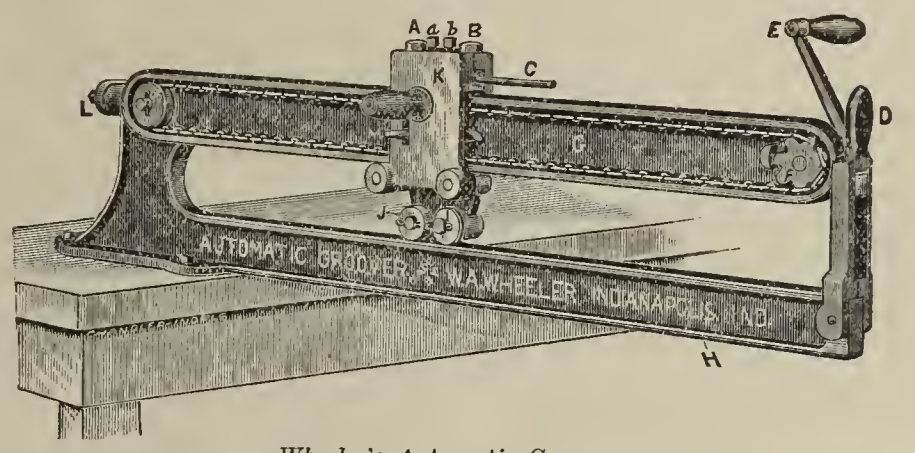
Official returns recently published show that the output of coal last year from the English Midland districts was affected by the coal strike to the extent of nearly 17,000,000 tons, compared with the preceding year. The falling off was comparatively as great in the other mining districts of Great Britain.

Wheeler's Automatic Groover.

We show in the accompanying illustration an automatic groover recently brought out by W. A. Wheeler, Indianapolis Elbow Company, Fort Wayne avenue and St. Clair street, Indianapolis, Ind. It is described as quite new in design, it being operated from the outer end, as indicated in the illustration. The operator can thus handle the work and run the machine without stepping out of his tracks, thereby saving much time. The carriage or sliding head, containing the grooving and seaming down rolls I and J, is brought forward over the work by means of a new device, consisting of a chain and sprocket wheel attached to the crank. A latch, M, pivoted within the sliding head, makes the connection with the chain and brings the head forward when the crank is turned. When the carriage has reached the end of its travel a projecting lug seen near the sprocket wheel strikes the beveled end of the latch, tilting it upward, thus freeing it from the chain and causing it to stop automatically. At the same time and just before the carriage comes to a stop, the pusher rod C strikes the top end of the clamp D, and throws it over simultaneously with the stopping of the carriage. The operator now takes hold of the handle on the side of the carriage with the left hand, and with one finger holding up the latch M, quickly shoots the carriage back to the starting point without moving the crank, thus releasing the work. The latch M is now ready to engage the chain again, which it does when the crank is turned. The automatic groover is designed to groove and roll down at one operation the seams on any kind of tin or sheet iron work, from the lightest tin to sheet iron as heavy as No. 24 gauge. It will groove pipe from 2¾ inches diameter and upward 30 inches long. Suitable rolls are furnished with each machine for the different kinds of work, and they can be quickly changed by simply removing a spring pin from the stud that carries them. The sprocket wheel, which drives the chain, is turned up true and the teeth milled out from the solid. Ample provision is made for adjustment and taking up of wear or lost motion.



Improved Squaring Shear for Cornice Makers.



Wheeler's Automatic Groover.

New York Trade School.

Thirteenth Annual Commencement.

Last Thursday evening an audience composed of 100 ladies, as many prominent tradesmen and over 500 scholars gathered in the auditorium of the New York Trade School, at Sixty seventh street and First avenue, which was tastefully decorated, to participate in the commencement ceremonies. At 8.30 p.m. President R. Fulton Cutting secured for the speakers a sympathetic audience by his genial welcome and promise that only inspiring speeches would be heard, as every speaker was either an officer or an ex-officer, and a natural leader. He then introduced John Byrns, ex-president of the National Association of Master Plumbers.

Address of John Byrns.

Mr. Byrns began by saying he had attended all of the commencements of the school, and grew prouder each year of the boy who gave up his nights or left his home to become a mechanic. Amid so many happy influences there was sorrow for the vacant chair of the founder of the institution, the late Col. Richard T. Auchmuty. He was present in spirit, however, and the world was better for his having lived. The work that he had started had now become a monument established to a memory that would compare with that other notable American, Peter Cooper. It had been so difficult at one time for the American boy to secure a chance to learn a trade that a great strike had been the result among the plumbers of New York, and he was sorry to see that again a movement was being made to interfere with apprentices.

"The old guard who surround me on the platform fought to a victory then, and are prepared to enter the fight for the boys again. Personally I am opposed to proscription against the American boy, and rather than submit to it I would go down to my Babylon home and raise non-union potatoes. Forty-three years ago I had no such chance as you have, who have had the best instructors in the world. In those days we could do as nice lead work as any of the samples you have shown, but we did not understand the vent, the syphon, and the science of the business, which you have been thoroughly taught. You are now going out to work, and there is plenty of room for you. If you want success, deserve it. I don't want to caution you about stealing lead and solder when I say be honest, but when you contract to give a man an hour's labor, 'render unto Cæsar the things that are Cæsar's.' We have raised plumbing from a mere trade to a profession, and in following it I want you to bring credit to it, to the Master Plumbers' Association of this city, which has done so much for you, to the school, which is an inestimable benefit contributed by a most worthy citizen, and to yourselves."

Presentation of Certificates.

President Cutting then stated that certificates of their proficiency would now be presented and introduced Wm. H. Oliver, who gave to the evening class ten certificates to house painters and 12 certificates to fresco painters and to the day class 13 certificates to house and sign painters.

The Allison Medal.

Every year the pupil who has shown the greatest ability in the various branches of painting is presented with a medal furnished by Wm. M. Allison and this year it was awarded to Nathan H. Larkin, who accepted it with a very graceful speech thanking Mr. Allison, Instructor McGowan and the awarding committee.

John H. McCullagh presented 36 certificates to evening scholars and 21 to day scholars in the carpentry class.

Mr. Cutting then introduced Stephen M. Wright, secretary of the General Society of Mechanics and Tradesmen.

Mr. Wright's Address.

In beginning he stated that he represented no organization of one branch of mechanics, but a society that had labored to uphold the whole mechanical interest of the nation. He stated that the founder of the institution had the aim of freeing the American boy from the opposition to his entrance to the trades, and his success enabled the scholars to reap a great benefit. "In your future enjoyment of the great privilege I caution you from ever interfering with others rising, but rather extend a helping hand to repay the favors you have received."

John Hughes presented 10 certificates to the plastering class, 3 to the stonecutting and 14 to the blacksmithing class.

Thomas J. Tuomey presented 40 certificates to the evening plumbing class, and Edward Murphy explained the amount of study in drawing, bookkeeping and lectures in addition to the manual training that was necessary to secure a trade school certificate, in presenting 114 certificates to the day class in plumbing.

The Trade School Yell

then shook the building, in surprise to all but the boys who gave:

"Zip! Boom! Rah! Hear us roar! Trade school boy of 94! Rah! Rah! Rah! Who are we! Plumbers!—As you all can see! Zip! Boom! Rah!"

Which was followed by a cheer for chief instructor of the plumbing class, John Delehanty, who is held in high esteem by all of the scholars.

President Cutting's Address.

Mr. Cutting stated that he was sorry that ex-Mayor Abram S. Hewitt of New York City was unavoidably absent, as it made it necessary for him to fill the place of a prominent speaker. Once, on being introduced to speak in the place of Chauncey M. Depew, as he arose half of the audience arose also and went out; but here he felt more sure of his audience. He then told how Colonel Auchmuty fought to preserve his country and at the close of the war began another patriotic fight in the interest of skilled labor. Taking as an example the Normans, who invaded England centuries ago and who built churches to establish morals for the country which now stands in the foremost ranks of the world, Colonel Auchmuty had established the trade school to build up skilled labor with a reputation for honesty and industry. "Having learned much here it is natural for you to think you can teach others a great deal, but in your teaching do not neglect to instill integrity into your life and the lives of your associates. Join the unions of organized labor and infuse into them the ideas of liberality and intelligence. They need you as a purifying influence and to teach them that the trade school is a boon to coming men. I now say goodby, commending to you the feeling of fellowship here engendered, and would have you remember that you represent he trade school and its interests. I may never see many of you again but, my interest will follow you always and everywhere. Should we meet again I shall be glad, and again I say goodby."

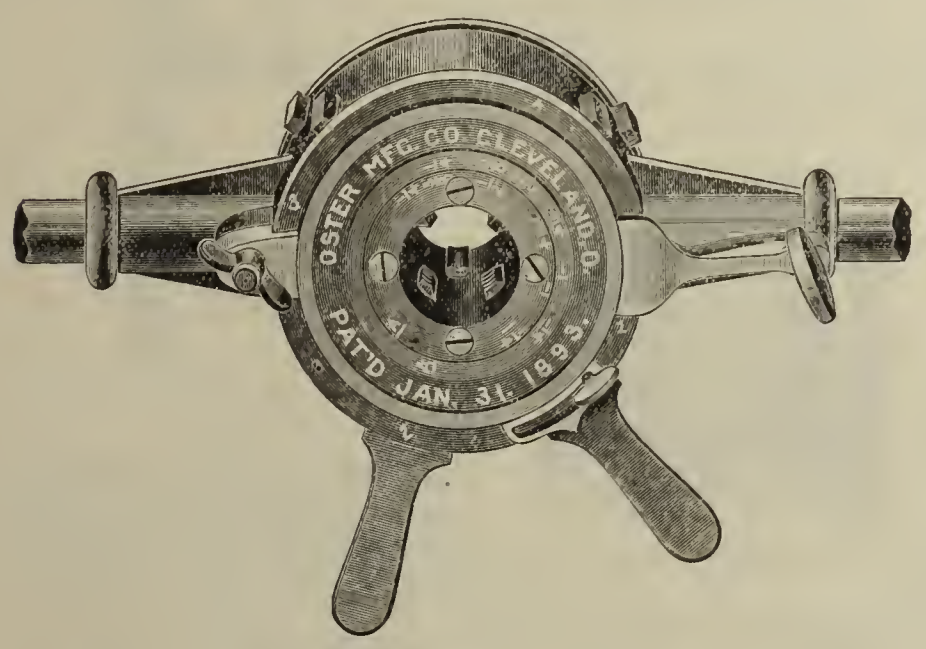
Graduates in Day Plumbing Class, 1894.

Adams, Thomas J., Yorktown Heights, N. Y.
Angell, Richard J., Oxford, Mass.
Arndtstein, Lewis, New York City.
Atkinson, Christopher, Columbia, S. C.
Barnes, Vincent M., Great Neck, L. I.
Barnes, Luther M., Collinsville, Conn.
Barry, Thomas E., Boulder, Col.
Battle, Edward, St. Thomas, Ontario, Canada.
Baum, William F., Bethlehem, Pa.
Beach, Bertie C., Green, N. Y.
Becker, Albert R., New Orleans, La.
Berle, Adam, New York City.
Bitz, Louis P., Port Chester, N. Y.
Blair, Walter H., Westfield, Mass.
Blakeslee, Asahel, Westfield, Mass.
Bohlman, Herman T., Portland, Ore.
Bouque, Eugene F., Moberly, Mo.
Bowron, Fdk. F., Long Island City, N. Y.
Boyd, James H., Chicago, Ill.
Brady, Francis P., Johnstown, Pa.
Brady, Joseph T., New York City.
Bratton, Walter B., Lewistown, Pa.
Bray, George S., Hazelton, Pa.
Bryant, Nimrod, Edwardsdale, Pa.
Buck, Emmer, Knoxville, Pa.
Clarke, James F., Lewistown, Pa.
Craigie, Charles E., Lancaster, N. H.
Crane, Henry W., Elizabeth, N. J.
Custer, Allen E., Bridgeton, N. J.
Danenfelser, George, Westchester, N. Y
Darling, Jr., Albert M., Riverhead, N.Y.
Dent, William J., Skaneateles, N. Y.
Doolittle, Elmer B., New Rochelle, N. Y.
Dougherty, Charles O., Altoona, Pa.
Dunn, William A., Newark, N. J.
Edgar, John M., Hyde Park, N. Y.
Edgar, William, Hyde Park, N. Y.
Engel, John J., Elizabeth, N. J.
Enright, John H., West Point, N. Y.
Fay, Herbert, Plantsville, Conn.
Fender, George, New York City.
Finigan, John, Paterson, N. J.
Fisher, Harry J., Pottsville, Pa.
Foster, Harvey N., Waterbury, Vt.
Foster, Luther E., Claremont, N. H.
Foster, William G., Pittston, Pa.
Foulois, William H., Washington, Conn.
Frain, Edward, Passaic, N. J.
Garvin, Peter J., New York City.
Gilligan, John J., Wilkes-Barre, Pa.
Goetchins, Maxwell V., Tower, Minn.
Hahn, Alvin W., New York City.
Harris, John A., Plymouth, Mass.
Hart, Jr., Albert, Pearsalls, N. Y.
Haug, Frederick, Brooklyn, N. Y.
Hawkins, Thomas W., Tottenville, N. Y.
Hawthorne, Ralph W., Elgin, Ill.
Hayden, Frank E., Cassopolis, Mich.
Higby, Charles H., Port Jervis, N. Y.
Ingalls, Richard, Lowell, Mass.
Jenks, George C., Goffstown, N. H.
Johnson, Ossian, New York City.
Jnergens, William J., Wheeling, W. Va.
Kenney, Albert F., Salem, Mass.
Kennely, Martin, East Winsted, Conn.
Klenke, Theodore A, New York City.
Kuhls, Charles L., College Point, L. I.
Lang, Edward W., Louisville, Ky.
McCollum, George B., Oil City, Pa.
McManamy, John, Lancaster, Ohio.
Moriarty, Patrick J., South Hadley Falls, Mass.
Morton, Reginald, Chiltonville, Mass.
Müller, Guido, Brooklyn, N. Y.
O'Hanlon, Charles J., Savannah, Ga.
O'Hara, Tracy, Paterson, N. J.
Otte, Jr., Fred. W., Peekskill, N. Y.
Petersen, William, Hoboken, N. J.
Pinchbeck, George A., New York City.
Pulte, William J., Grand Rapids, Mich.
Quicke, Thomas J., West Point, N. Y.
Reese, Jay W., Cazenovia, N. Y.
Recker, Frank L, Altoona, Pa.
Redfield, Charles H., Sag Harbor, L. I.
Regan, Frederick, St. Stephen, New Brunswick, Canada.
Rhoads, George M., Reynoldsville, Pa.
Royce, Eugene, Avon, N. Y.
Rutledge, Pearl B., Bellefontaine, Ohio.
Ryan, William A., Hamilton, N. Y.
Sargent, Edwin F., Haverhill, Mass.
Seelig, George W., Buffalo, N. Y.
Semler, Joseph R., Newburgh, N. Y.
Solomon, Thomas H., Jermyn, Pa.
Soult, George H., Lewistown, Pa.
Sullivan, William E., Ridgefield, Conn.
Sullivan, George J., New York City.
Trexler, Frank H., Williamsport, Pa.
Tryon, Thomas L., Elizabeth, N. J.
Tucker, Oliver M., Newark, Ohio.

Updegrave, J. Frank, Johnstown, Pa.
Vegiard, Charles E., Scranton, Pa.
Vincent, William H., East Hampton, L. I.
Volckening, Frederick W., Brooklyn, N. Y.
Von Lunen, George, Johnstown, Pa.
Von Beck, John M., Carbondale, Pa.
Walter, Ernest, Toledo, Ohio.
Weed, John F., New York City.
Wharen, Harrison C., White Haven, Pa.
White, Alfred J., Los Angeles, Cal.
Williams, W. H., Larksville, Pa.
Wood, Roy O., Bedford, Ohio.
Woodruff, Joseph W., Elizabeth, N. J.
Wrench, William C., Montclair, N. J.
Yeager, Ezra K., Natalie, Pa.
Zinn, George, Hackensack, N. J.

The Oster Adjustable Die Stock.

The cut shown herewith is of an adjustable die stock offered by the Oster Mfg. Company, Cleveland, Ohio. The tool is for hand use for threading pipe and bolts, one stock threading from four to six sizes. It is stated that the stock is made of a new process metal, many times stronger than steel in breaking quality, and that the dies are a special brand of fine steel, strong and durable,



The Oster Adjustable Die Stock.

and that they may be sharpened on a grindstone. It is explained that large pipe can be easily threaded by taking two cuts; that a cut off may be included if desired, combining two tools in one—threading and cutting off; that there is no waste of material, and that oil holes give an opportunity of oiling the dies while in use. The manufacturers claim that the stock is self centering, making a perfect thread every time; that in use no turning back over threads is necessary; that the stock is instantly adjustable and removable; that the adjustable positive stop enables the operator to thread any number of pieces of a given size without resetting, and that the device for holding the cams in position while threading is positive and warranted not to slip. The dies and guides are operated by a cam movement, having suitable handles to enable the operator to easily adjust them to any desired size. The tool is made in six sizes, for pipe from ⅛ to 4 inches. Stocks cutting from 1¼ to 4 inches have four handles; other sizes have two handles.

The last Wisconsin Legislature enacted a law doing away with the three days' grace on promissory notes, the law to take effect April 5 of this year. There has been considerable doubt as to what effect the law would have on paper issued on or before April 5. Last week the bankers of Milwaukee issued the following: "By advice of counsel in whom we have full confidence, the banks of Milwaukee have concluded that the law abolishing the days of grace in Wisconsin will take effect and be in force April 6, 1894. We conclude that the act applies to negotiable paper issued on or after April 6, 1894, and not to paper executed prior to that date. We do not believe that the law can apply to negotiable paper in existence at the time it was passed, because it would impair the obligation of the contract; nor to negotiable paper executed prior to April 6, 1894, because it does not take effect until that date, and there are no words evincing any intent of the Legislature to make the act retroactive."

The Uniform Bill of Lading.

The Philadelphia *Manufacturer* calls attention to the victory just now won by the National Transportation Association (an association of shippers) in a contest with the railroad companies against a proposed invasion of shippers' rights. The railroads lately prepared a uniform bill of lading, which they tried to compel the public to accept. This bill of lading contained many clauses of an unfair character, as, for example, one that relieved the transportation companies absolutely from all liability for goods damaged or destroyed by the negligence of the companies' servants. It also had printed across the face of it in large letters the word "non-negotiable," and it made new classifications of freights directly to the advantage of the carriers and against the advantage of shippers. Well-informed persons have fully understood that a bill of lading of such a kind will not stand the test of submission to a court of justice. But the great mass of shippers are not well informed, and the usefulness of such a formidable document to the companies lay in the fact that it might be used to frighten and discourage ignorant, timid and poor men from pressing just claims against the companies.

The attempt to force this bill of lading into use was resisted by the National Transportation Association, of which the Manufacturers' Club is a member. That body protested to the railroad companies; but it did much more. It presented the matter to the Inter-State Commerce Commission backed by 40,000 signatures to an appeal for protection, and it even carried the case into Congress in a petition for legislation which shall make this kind of thing impossible for the future. A speedy consequence of all this active effort has been that the Chicago & Grand Trunk Railroad Company have announced at Chicago that they, for their part, withdraw from the attempt to impose on the public, and repudiate the proposed uniform bill of lading. The company have prepared a bill of lading of their own, containing a small amount of matter, phrased in plain language, and declaring themselves "subject to carrier's liability under the common law in force in the various States, Territories, Provinces, or foreign countries through which the goods may pass."

This is enough for any carrier who proposes to deal fairly with its clients. For in any case, no matter what the bill of lading may say, such matters are governed by law and are always disposed of in accordance with law when a shipper who has had damage has persistence enough to seek justice resolutely, without regard for restrictions and conditions put upon him by the carrier. The time has not yet come when American legislation will relieve public transportation companies from responsibility for valuable material intrusted to their care and for the movement of which fair prices have been paid.

The action of the Grand Trunk Railroad Company will probably cause the abandonment of the uniform bill of lading by all the companies. Competition for business is too eager to permit one line to have the advantage bid for by this concession to indignant public opinion.

The brown prismatic powder furnished by the Duponts for use in the trial tests of the 13-inch gun did not prove as powerful as expected, so that the range test of throwing the 1100-pound projectile 10 miles will not be made until a better quality of powder, having greater velocity, is provided.

Ocean steamship lines report that the number of immigrants booked by them this season is 60 per cent. less than at this time last year, and official figures show that the number entering the port of New York during the past three months was 17,767 less than in the corresponding period of last year. Dull times and strictness in enforcing the immigration laws are credited with this decline.

The recent action of the Superintendent of Canals, under authority of the New York State Legislature, in granting an exclusive 50-year contract to the Cataract General Electric Company for the transmission of electricity along the banks of the canals of the State, with the right to supply light and power not only for use on the canals, but in all the adjacent territory, has raised a storm of indignant protest in several quarters.

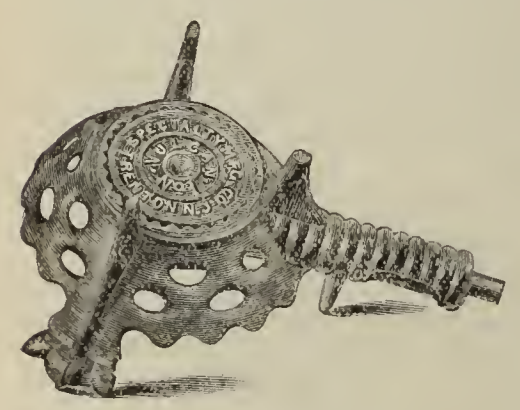
There is said to be a movement on foot among the paper manufacturers of the United States toward a great national combination, or pool, of all the mills.

Terence V. Powderly has filed a claim against the executive board of the Knights of Labor for back salary as General Master Workman.

THE RETAIL STORE.

Vulcan Gas Burner.

The Specialty Mfg. Company of Trenton, N. J., through their selling agents, James R. Steers & Co. of 42 and 44 Broad street, New York, are putting on the market the gas burner or stove shown in the accompanying cut. The burner is intended for use in bedrooms or other places where a quiet and powerful heat is required for heating water or other purposes. It consists of a malleable iron frame or stand, having a removable center piece or burner made of the same material. The supply connection is simply a pointed tube which screws into the sleeve and allows of a piece of rubber tubing being slipped



Vulcan Gas Burner.

over its outer end. The pointed supply tube connects with a passage in the sleeve of the stand and thus allows of the passage of gas to the point of combustion. Provision is made by means of the screwed supply tube for the combination of air with gas, and the combination may be regulated by screwing the tube in or out so as to get the most efficient combustion. The burner consumes but 3 feet of gas per hour, and it is claimed that the pressure required is so slight that the tubing conveying the gas may be placed over the ordinary jet burner without removing the tip. There is no gauze in the burner, and nothing to break or give out. The burner is of neat appearance, light in weight, and occupies very little space. The makers claim that it will heat a quart of water in four minutes, and is easily adjusted to any gas pressure, a turning of the supply tube until a blue flame results being all that is required.

The McKim Patent Measure.

We show in the accompanying illustrations views of the McKim iron bottom ½-bushel measure being put on the market by the Bellaire Stamping Company, Harvey, Ill. Fig. 1 is a general view of the measure, while Fig. 2 shows it with side wall cut away, revealing the top finish and the method of joining on the bottom. Special emphasis is laid upon the fact that it is made of solid steel, the bottom being fastened mechanically in a slot. This slot is formed in an ingenious manner by a series of folds in the bottom of the measure, which can be clearly seen in Fig. 2. The bottom is further strengthened by a metal foot riveted to the center of the bottom



The McKim Patent Measure.—Fig. 1.—General View of Measure.

plate, which prevents the bottom springing down, however great the pressure upon it. The measures are made of a

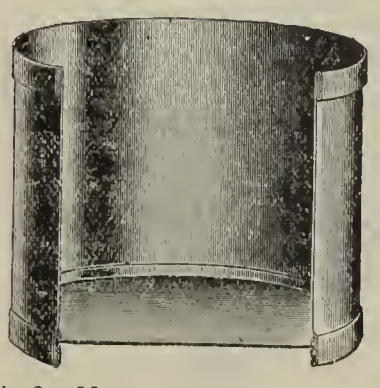


Fig. 2.—Measure with Side Broken Away.

heavy gauge of metal and are thoroughly painted.

Standard Towel Holder.

Hamblin & Russell Mfg. Company, Worcester, Mass., are putting this article on the market. It is represented in the illustration herewith given, which indicates its construction and the manner in which it is used. The holder consists of two parts, each of which is made of one continuous piece of steel wire. One of the parts is screwed in

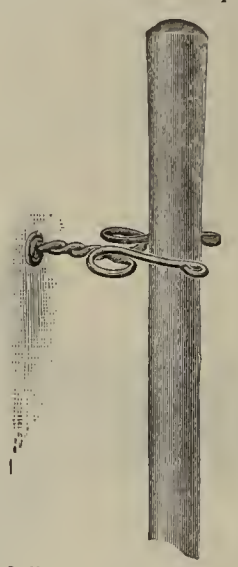


Standard Towel Holder.

the wall or partition, the other part or holder proper being suspended from it. The holder is neatly nickeled.

Standard Broom, Brush and Tool Holder.

This device is being put on the market by the Hamblin & Russell Mfg. Company, Worcester, Mass., and is shown in the accompanying illustration, which represents its shape and use.

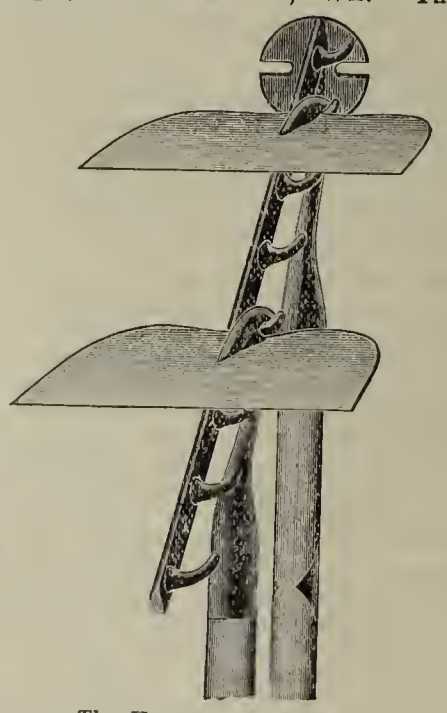


Standard Broom, Brush and Tool Holder.

The holder consists of two steel wires which are twisted together in the manner shown. The end of one of the wires is threaded to act as a screw in securing the holder in place. The holders are made tinned and nickeled.

The Hager Hoe Bracket.

The cut here shown represents a hoe bracket being introduced by John N. Hager, Fort Atkinson, Wis. The



The Hager Hoe Bracket.

bracket is provided with eight hooks, and is described as convenient for hanging up the hoes or taking them down without one hoe interfering with any of the others.

STOVE TRADE NOTES.

The Local Stove Trade.

The stove trade in New York and vicinity during the month of March showed a decided improvement over that of February, and more nearly approached the normal volume than at any time for five or six months past. The atmosphere in the wholesale houses was more charged with business; there was more general activity in nearly all departments ; more correspondence, more requests for quotations, more callers from among the dealers, and the quiet and hush that characterized the first two months of 1894 in the stove business and made the business days more like a succession of Sundays was gone—it is hoped never to return, while with the dealers themselves there was less gloom, and instead of the almost automatic shake of the head when the salesman called there was something they needed and ordered.

The repair business, which naturally commenced last fall to increase when the traffic in stoves declined, is now falling off, due largely, of course, to the departure of cold weather, but likewise due in part to a return of confidence among those who can afford to throw the old stove away and purchase a new one. There is nothing in the present increased demand to encourage any hopes of an approaching boom, and nothing to warrant the expectation of large dividends at the end of the year in the stove line, for prices are low and have been cut to an unprofitable point. Many sales have been effected by wholesalers accepting offers made by dealers who know what a bargain is and can afford to hold the goods awhile if necessary. Some orders, too, have been complimentary to the drummers, and did not indicate particular revival of trade with those who gave them. Again, a large percentage of the output of local foundries for March was made on orders from abroad and for new buildings, still leaving, as will be seen, a limited local demand for the smaller portable cooking constructions. But in this line improvement was also noted, and city dealers ordered by the dozen, instead of one or two at a time, as they had been doing since December 1.

The deficiency in demand appears to be settling down to the actual point where the non-employment of working men—those who depend for a living entirely on daily wages—affects trade, and shows less timidity among the middle classes and those who have money saved. This is apparent from the orders, postponed for many months, that are being placed to renew or alter furnaces or heaters or for other changes in the heating plants in private residences.

The most encouraging sign that the revival is genuine and will soon reach the poorer classes, naturally the last to benefit by a return to prosperous times, is the fact that renewed activity in building is taking place in the cities hereabouts on a satisfactory basis, even better than has existed for two or three years past. Many well-known representative and monied men who have been missed from the field for two years or more are making their reappearance and preparing for large operations. The architects' tables are full of plans, the builders' mercantile agencies are becoming active with inquiries about builders whose past records are gratifying to those who inquire, and the agencies are receiving many visits from regular builders who call to announce their intention of undertaking building operations and to make statements of their financial condition.

The speculators are relegated to the rear and an era of healthful prosperity in this line seems at hand. As it is the great mainspring of business, it contains great encouragement and must give employment to thousands of men whose demands on the stove dealers as well as many others will soon compel the employment of other mechanics to supply their wants. Thus the snowball of trade is started on its way, growing in circumference with every turn.

The reason for this activity in building when commercial business generally is but just emerging from such great prostration is plain, for builders realize that values cannot be much lower than at present, and no more favorable time could be expected in which to make contracts. The effect of tariff changes has been discounted and competition from worthless speculative builders is not to be feared. While some materials may go a little lower, everything has nearly touched bottom, and with the last decline reaction is sure to come and the rebound would carry prices above the present market.

It must be borne in mind that the weather during March was very favorable to business, and some portion of it may have been borrowed from April, so that the volume of business this month may be somewhat disappointing, but the fact remains that city trade is on the up grade, and combining the months of March and April, a smaller percentage of decline compared to the same months of 1893 will undoubtedly appear than a comparison for two years of a combination of January and February would show. Very few new patterns of ranges have been brought out this spring, and under the circumstances but few were expected by the dealers.

SIFTER.

The Art Stove Company

of Detroit, Mich., have just issued from the press a new catalogue which is a credit to their taste and understanding of what dealers require in the way of trade literature. It is substantially bound in board covers, is printed in black upon a good quality of calendered paper and is of a size and shape to facilitate reference. The edges of the pages are tinted in a color to form a pleasing contrast with the shade of the cover. The opening pages are given up to various matters of general and specific interest to the dealer, while the body of the work contains illustrations and descriptive matter relative to several lines of new goods. Among the latter may be mentioned the Laurel steel range, embodying the latest improvements and made in a variety of styles and sizes ; the Home Laurel six-hole range, made for hard or soft coal. coke, wood or natural gas, and the Family Laurel range, made with four and also with six boiler holes. These goods are referred to as first class in all respects and as embodying those features which render them satisfactory in operation. The ornamentation is of a high order of merit, the nickel plated portions forming a pleasing contrast with the black iron surfaces. In the way of cook stoves the company have added to their assortment the Family Laurel, a four-hole construction provided with duplex or shaking and dumping grate, new and improved hearth, patent oven door opener, large ash pan, ventilated oven and interchangeable reservoir, so that a square stove can be converted into a bracket reservoir stove if desired. The Peerless Laurel six-hole wood range is another new line which the company have brought out in a variety of styles and sizes The makers refer to the Peerless Laurel as "one of the most complete lines ever offered in wood burning ranges, constructed in such a manner as to give the highest possible results." A number of pages are also given to heating stoves known under such names as Radiant, Novelty, the Parlor Laurel, the Oakland, the Cannon Laurel, the New Oak, Monarch Laurel and the Cottage Laurel. The catalogue closes with illustrations of an interesting line of oil heating stoves known under the names Art Laurel and Combination Laurel, followed by a line of improved lamp stoves. The catalogue is neatly arranged throughout and closes with an alphabetical index. The company are doing a good business in their specialties and state that they are running their works full capacity.

ODD PLATES.

SOME OF THE NEW THINGS of the Boynton Furnace Company, 207 and 209 Water street, New York, are the Lakewood range and the Revertible Flue Steel Dome furnace. The range is of the double oven variety and presents a handsome appearance with several attractive features. The bottom plate is of cast iron, having the flue strip as part of it, and can be lifted out, so that the flue can be readily cleaned. The bottom of the oven flue is covered with a non-conducting coating. The water back bears a label stating that it has been tested so stand 100 pounds pressure, and is novel in shape. It lies at the back and inclines toward the front, and extends for a short distance along each side of the fire chamber. A revolving grate and an ash sifter below makes a convenient fire chamber equipment. The range is furnished with either a handsome base or a hot closet under each oven. A nickeled front hearth in one piece extending across the range is a new ornament. The furnace has a substantial base, a capacious ash pit and a lever shaking center dump grate. A cast

iron fire pot supports a large steel dome of heavy plate and gas proof construction. From the sides of the dome two indirect draft columns of steel plate turn down and connect with a crescent shaped flue at the bottom. This crescent flue has at the back another steel column, which connects at the top with both the smoke pipe and the steel dome, a damper in the connection making the furnace either direct draft or revertible flue. A connection between the crescent flue and the back of the ash pit controlled by a damper affords an efficient dust flue and check damper. The casing rings are made for the use of an inner and outer casing.

THE UNION IRON WORKS of Spokane, Wash., contemplate adding a new and larger size to their line of box heating stoves, intended for use in country school houses and railway stations. The following squib is from a local paper of recent date: "Owing to the non-payment by the city for the heat supplied by the Hotel Spokane to the Mining Exchange the steam was turned off recently, much to the discomfort of the visitors and those engaged there As there seemed no chance of an immediate settlement of the trouble Harry E. Curtis, proprietor of the Union Iron Works, kindly donated a large stove to the exchange, and the mercury has again risen to a comfortable degree. The stove donated is a simon pure Spokane product, and is as good a heater as is made in any other part of the country, being especially adapted to heating offices."

JOHN F. BANNON, assignee of the Security Gas & Vapor Stove Company of St. Louis, Mo., has recently disposed of the property to L. B. Jones, who, we understand, intends, with a large working capital, to immediately put the plant into active operation. It is stated that the property sold for more than enough to pay 100 cents on the dollar to the creditors, thus leaving something for the stockholders. It is intimated that Mr. Jones will erect a large factory on the line of the railroad, and thus be in a position to enjoy exceptional shipping facilities.

THE FLORENCE STOVE WORKS at Florence, Ala., were sold on Thursday, March 22, by the trustee of the old land company to H. Thoele and associates. We understand the plant will be put in good condition, and as soon as the work is completed will be actively operated.

THE KEELEY STOVE COMPANY of Columbia, Pa., commenced on Monday, March 26, running five days in the week. For some time past they ran but three days in the week.

THE CORNING STOVE WORKS, located at Corning, N. Y., are now in full operation and running full time.

THE BRAMHALL DEANE COMPANY of New York City were incorporated last week, with a capital of $300,000, for the purpose of manufacturing cooking, heating and ventilating apparatus. The directors are Royal E. Deane, George G. Brooks and George Rawlins of New York City.

THE ROGERS STOVE FOUNDRY, at Belleville, Ill., resumed operations on Tuesday, March 27.

THOMAS FLETCHER, the well-known English manufacturer of gas stoves, in reply to some adverse criticism, writes to the *British Medical Journal* relative to cooking by gas. Among other things he says that for heavy and continuous use, both fuels being used with equal economy, 1 pound of coke or coal is equal in heating power to about 19 cubic feet of ordinary coal gas, the actual comparative cost depending upon local prices. For irregular work, such as cooking, he says that gas is in price a far cheaper fuel than coke or coal.

THE DANGLER STOVE & MFG. COMPANY of Cleveland, Ohio, have recently issued from the press a very attractive catalogue of the Dangler gas stoves and ranges for the season of 1894. The frontispiece consists of a bird's eye view of the company's works, followed by an announcement to the trade in which it is stated that during the season of 1893 their business showed a very large increase over that of any previous season. The 48 pages of which the catalogue consists carry illustrations of a varied line of gas burning appliances adapted for heating and cooking purposes. The descriptive text is of such a character as to inform the dealer as to the special features embodied, while the engravings are specially fine. Cabinet gas ranges, shown with and without connections for hot water boiler, occupy the early pages, following which are junior stoves, hot plates, ovens, burners, water coil attachments, &c. The Dangler radiator occupies several pages, as does also the Dangler cylinder heaters. The little volume is carefully arranged, neatly printed and bound in colored paper covers, with side title embossed in black and old gold. A telegraphic code is a valuable feature of the work.

THE MOUNT PENN STOVE WORKS have purchased the stove business of George Uniacke, 111 and 113 North Second street, Philadelphia, formerly carried on by Thos. Holt, and more recently by Naylor & Uniacke, and will in future conduct it in their own name, carrying a complete line of goods. They propose also to keep in stock the usual line of stove dealers' goods, including gas, gasoline and oil stoves and ranges, vapor torches, plumbers' soldering pots, refrigerators, hollow ware, tinned and enameled ware, farmers' boilers and kettles, mica, stove polish, fire brick and furnace and stove repairs. The store will be in charge of George Uniacke.

WM. HIGHTON & SONS, 55 Charlestown street, Boston, Mass., have taken the agency for the line of furnace fittings made by the Excelsior Steel Furnace Company, Chicago, and in addition to a full line of samples will carry an assorted stock, a feature of which will be oval goods to suit that market.

SECRETARY JOHN A. HABEN of the Excelsior Steel Furnace Company of Chicago was in New York this week calling on the trade in the interest of their line of furnaces.

WE ARE INDEBTED to the Eclipse Stove Company of Mansfield, Ohio, for a copy of a neatly arranged catalogue illustrating and describing their Premier Eclipse six-hole range. This stove is of substantial appearance, handsome ornamentation and embodies the latest improvements. The castings are described as smoothly finished, the fitting first class and the trimmings of a high order. The range is made two sizes for wood and two sizes for coal or wood. The engravings in the pamphlet are well executed, clearly showing the features of ornamentation, while the descriptive text is of such a character as to give the dealer all necessary information. The last page of the pamphlet contains a request to those interested to write for a copy of their catalogue and discounts on their entire line of Eclipse stoves and ranges.

A CITIZEN OF WESTERN PENNSYLVANIA, residing in Sharon, recently ordered a stove from the foundry in that place, presumably that of Graff & Co., proprietors of the Sharon Stove Works. The customer was somewhat in a hurry for this piece of kitchen furniture, but desired it made especially for him and a record kept of the time consumed from the melting of the pig iron to the starting of the fire in the stove for cooking purposes. The order was taken, the pig iron melted, the cast made, the parts assembled, put together, polished, and the stove delivered at the house of the purchaser in just six hours from the time of beginning operations.

OUR READERS will remember that some time since we mentioned in these columns the fact that a relief fund had been started in the city of Detroit for the needs of the worthy suffering from the extreme business depression. It was also stated that a leading spirit in the movement was George H. Barbour, well known from his connection with the Michigan Stove Company. In a recent issue of the Detroit *Free Press* is presented a detailed statement showing the collections and disbursements, and the manner in which the fund was distributed. The receipts amounted to over $11,000, most of which was distributed by checks to the superintendents of associated charities.

WE HAVE BEFORE US a photograph of the interior of the salesroom of Sam S. Utter of 113 Beekman street, New York City. The picture shows the arrangement of the cast iron stoves and ranges, as well as that of an extensive line of oil cook stoves and heaters, in which Mr. Utter has built up a large and profitable business. Casting about for the owner of the establishment, we find him standing in the background of the picture, one hand resting upon the top of a cook stove while the other is partially inserted in his trousers pocket. The silk hat occupies its customary poise and beneath it beams the face of the genial Sam. Accompanying the photograph we have a folder for 1894, relating to the Beauty and New Beauty oil stoves. These are made in different styles and sizes, are neatly finished in nickel plate and japan and embody features of construction which have established for them a wide and growing popularity.

THE CRAIG-REYNOLDS FOUNDRY COMPANY of Dayton, Ohio, are offering the trade a new furnace known as the Triumph. It is carefully constructed in all its parts, has sectional porcupine fire pot, thus enabling the anti-clinker grate to be easily removed when desired, improved dust damper and other features on which the manufacturers base claims to superiority. The company refer to the durability, economy and cheapness of the heater, and feel confident it will prove popular with the trade.

PENINSULAR STOVE COMPANY are distributing from their Chicago office a circular stating that they are prepared to furnish customers with all kinds of stationery, the letter heads, bill heads, &c., having a lithographed heading as shown on a sample sheet which they inclose. The sheet also indicates the quality of the paper used, the dimensions of the various kinds of stationery

which can be supplied, and the prices for the same in 500 and 1000 lots.

It is reported that wages have been restored at Wood, Bishop & Co.'s foundry at Bangor, Maine.

The Schaab Puff Stove Company of 519–521 Locust street, St. Louis, Mo., have issued their first catalogue illustrating and describing the Empire stoves and ranges, which they manufacture. The steel range made under this name is constructed in a substantial manner, embodying the modern improvements, and is offered in several sizes. It is shown in the catalogue with and without connection with hot water boiler. The company also call attention to the Prize Empire four-hole coal range, the Home Empire four-hole cook, adapted for burning coal and wood, the Popular Empire four-hole cook stove, the Prize Empire wood range, the Farmer's Pride wood cook, and the Hero. The heating stoves include the Radiant Empire, Oak Empire, Floral Empire, New Twilight, Telephone and the Rose. The company are general agents for Dangler gas and gasoline stoves, Palace King furnaces, North Star refrigerators, as well as various lines of hollow ware, &c.

Edward Carton, president of the Carton Furnace Company, Utica, N. Y., was a visitor in New York City this week.

The Novelty Mfg. Company of Jackson, Mich, have brought out an entire new line of oil cooking stoves for the season of 1894. The line is put on the market under the style of Splendid oil cooking stoves. They resemble in appearance some styles of gasoline stoves, having a steel frame supporting a square steel top of commodious size, in which are inserted the usual cooking grates. The lamp is supported in the lower part of the frame work, while the reservoir is made in the shape of a horizontal cylinder, holding ½ gallon of oil, and located at the rear of the burner, so far from the lamp that it is impossible for the oil to become heated. The No. 1 stove has a single 8-inch circular burner, and is 16 inches high. The No. 2 stove has two 8-inch circular burners, with a ¾-gallon reservoir, and also stands 16 inches high. The No. 220 has two 10-inch circular burners, with a 1-gallon reservoir, and is 30 inches high. The No. 235 stove is a three-burner step stove, having two 10-inch burners and one 15-inch burner for the step. It is supplied with two polished brass horizontal tanks, each holding a gallon of oil. The hight of this stove is 30 inches. It is of large cooking capacity, to meet the requirements of a large family. These stoves are fully illustrated and described in a neat catalogue just issued, which also contains illustrations and descriptions of the Ruby round wick lamp stove and the Twin Ruby.

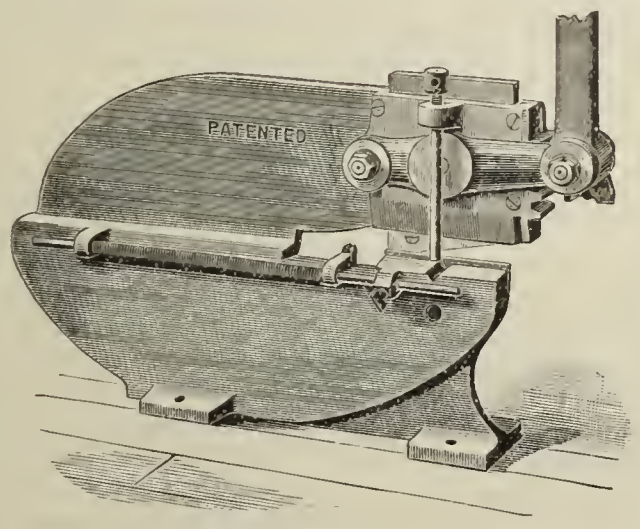
The Ingersoll Mfg. Company of Lansing, Mich., are manufacturing a lamp stove of original design which they style the Magic Room Heater. It consists of a 300 candle power lamp, mounted in a light but strong skeleton frame, which supports overhead a drum of Russia sheet iron. Inside the drum is a double cone made of thin strips of metal of a total length of 500 feet, which is termed the Ingersoll heat battery. The statement is made that with the use of this battery the heating power of the lamp is greatly increased. The heat strikes the lower apex of the cone and is rapidly absorbed by the radiating and intercommunicating strips of metal forming the battery until every part of it becomes heated, and every interstice forms an air duct or pipe through which a strong upward air current is induced which is the full size of the drum, 10 inches in diameter. The manufacturers estimate that in about six minutes a volume of air equal to the contents of a room 16 x 16 feet will pass through the battery. A grate at the top enables the lamp to be used for cooking. It furnishes light at the same time. The parts can easily be lifted out and used separately. The extreme hight of the stove is 30 inches.

The Michigan Stove Company have issued a very pretty catalogue of their Oak-Garland line of heating stoves for hard or soft coal or wood. This catalogue is printed on super-calendered paper in black and red ink, has an illuminated title page, is tied with blue silk cord and consists of 12 pages. The stoves illustrated and described are the Oakdale-Garland, an elegantly designed all cast stove, with both direct draft and revertible flue; the Syphon Oak-Garland, a base heater of original construction, giving a return flue to a boiler iron stove, and specially designed for keeping a fire of soft coal; the 1894 Oak-Garland, for any kind of fuel, in four sizes, furnished with a patented cut off grate when used for wood; the Horizontal Oak-Garland, for wood, with direct draft and revertible flue; the Oak Pennant, a lower priced boiler iron stove, intended for any fuel and made in seven sizes. The Michigan Stove Company's line, it will be seen, is so extensive as to cover every requirement for an oak stove. It embraces stoves adapted to every kind of fuel, even including chips and hay. All tastes are considered, from those who desire the most ornate constructions, rich in nickel and fine carving, down to those who are looking for something reasonable in price to compete with cannon and box stoves. It is unquestionably a magnificent line, as stated in the catalogue.

The many friends of Washington M. Shaddinger, secretary of the Detroit Stove Works, will be pleased to learn that on the 2d inst. he was united in marriage to Florence B. Borgman at Detroit, Mich. Our genial friend Shaddinger had appeared to be proof against the attractions of the fair sex, and the step he has taken is strong evidence that he must have at last encountered a lady of superior charms and far more than ordinary graces. The happy couple are "at home" at the Lexington Hotel, Chicago.

The Conqueror Sheet Iron Shear.

This shear is so designed that pieces of any length can be cut, and that the piece cut off will not bend up, but will be kept straight. This is made possible by the peculiar form of the frame, the upper half of which is set over so that it is not in line with the lower. This provides an unobstructed passage for the edge of the sheet in line with the knives. The piece being cut off also has a free passage in line with the knives on the opposite side of the frame. By referring to the engraving there will be noticed on the side of the frame, and parallel with the knives, a rod upon which is coiled a spring. This spring acts upon an arm which is free to slide on the rod and which is forced toward the knives by the spring. The arm is designed to enter between the sheet and the piece cut from it and to thereby slightly separate the two. It is evident that the thickness of the metal being cut will control the position of the arm, it being nearer the knives when the sheet is thin. The upper knife is actuated by a lever to the free end of which is attached the handle, in the end of which is a segmental gear adapted to engage a rack in the frame. This construction is extremely simple and provides ample power. This machine is made in two sizes by Chas. G. Eckstein & Co. of 41 John street, New York. No. 1 will shear $\frac{5}{32}$-inch sheet iron and has knives 5½ inches long; No. 2 will shear 1¼-inch sheet iron and has knives 6 inches long.



The Conqueror Sheet Iron Shear.

The number of vessels passing through the Suez Canal last year was 3341, as against 3559 in 1892. Of these 2262 were under the English flag. The time of transit through the canal has been gradually reduced of late years, since the aid of the electric light for night navigation has been introduced. The average length of passage last year was 20 hours 45 minutes per vessel. In 1891 and 1892 it was 23 hours 31 minutes and 21 hours 16 minutes, respectively.

The latest estimate of the mint bureau places the production of gold throughout the world in 1893 at $150,000,000. In 1892 the production was $138,860,000.

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TRADE REPORT.

The Iron Market.

The condition of the market seems to be precisely as noted in our last. Manufacturers and dealers report a good inquiry and somewhat larger sales, but unfortunately that about exhausts all the favorable features. Prices are easier, and, in fact, lower on Pig Iron, while there is no perceptible improvement in Billets and Finished Material. This hardly bears out the statement that the market is better, although there is reason to believe that the tendency is in that direction, and with anything to give it a start the movement might become one of great activity. For the present, however, there is no disposition to buy anything that can be postponed until a later date, so that it will evidently require something sharp and decisive before consumers can be induced to abandon their hand to mouth policy.

The reduction in freights from Southern furnaces to points north of the Ohio River, amounting to 50¢ @ 65¢, has allowed Southern furnace agents to crowd their prices down further. To some extent, however, the reduction had already been discounted.

Pig Iron.—The New York market is quiet. The great battle ground at the present seems to be the New England market, where Virginis, Alabama, Mahoning and Shenango Valley, Eastern Pennsylvania and Buffalo furnaces are fighting for their share of the market. As yet freights from Southern furnaces to New England and to tidewater points are unchanged, but the drop of 50¢ to other sections is supposed to indicate a similar reduction to this section. Among the Cast Iron Pipe contracts about to be closed is one for about 4000 tons for Syracuse, 1500 to 1800 tons for Buffalo and 600 to 800 tons for Niagara Falls. We quote standard brands $12 75 @ $13.50 for No. 1; $12 @ $12.50 for No. 2, at tidewater. Southern Iron, same delivery, $12.25 @ $13 for No. 1; $11 @ $11.50 for No. 2; $10.75 @ $11.25 for No. 3; $11 @ $11.25 for No. 2 Soft, and $11.25 @ $11.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.25 @ $10.75.

There has been a pretty fair demand for Pig Iron in the Philadelphia market, but the increased output furnished more than a full supply, the result being somewhat lower prices for all descriptions. Foundries are gradually resuming work, but at best the consumption does not average more than 50 to 60 % of what is usual at this season of the year, so that there is still plenty of margin for improvement. Among the curious changes noted in regard to the Pig Iron trade is the practical withdrawal of the Alabama furnaces from this market, and the increasing competition from Central and Western Pennsylvania. The last mentioned appear to control prices entirely, and furnaces that are unable to compete have no alternative but to stand aside. Quotations vary considerably, but as a rule delivered prices for Philadelphia and equivalent points are about as follows:

Standard No. 1 Foundry X	$12.75 @	$13.25
Standard No. 2 Foundry X	12.00 @	12.50
No. 2 Plain	11 00 @	11.25
No. 1 Soft	11.75 @	12.00
No. 2 Soft	11.00 @	11.25

Our Chicago agent reports that another disturbance has occurred in that market in the sudden reduction of freight rates on Southern Pig Iron to the Chicago market to $3 ℔ ton from the Birmingham district. This rate is very much lower than anything ever before known. It at present applies only to the immediate vicinity of Chicago, but dealers expect that, as usual, it will very shortly be made to apply to other points which have hitherto taken Chicago rates. Prices were immediately affected by the reduction, but they have not so far led to much new business. The reductions made in the price of local Irons have not been so great as on Southern, because a part of the drop had been previously anticipated. The bulk of transactions during the past week was as usual in locations in which a moderately active trade was reported, with considerable inquiry indicating an early expansion of business. Consumption is steadily increasing. The largest sale of Lake Superior Charcoal reported during the week was one of 500 tons at private terms. Freight rates to this point from Northern Wisconsin have, curiously, been advanced 25¢ ℔ ton. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @	$15.50
Local Coke Foundry, No. 1	11.25 @	11.50
Local Coke Foundry, No. 2	10.50 @	11.00
Local Coke Foundry, No. 3	10.00 @	10.50
Local Scotch	11.50 @	11.75
Ohio Strong Softeners No. 1	13.00 @	14.00
Southern Silvery, No. 1	@	11.50
Southern Silvery, No. 2	@	11.00
Southern Coke, No. 2	10.00 @	10.35
Southern Coke, No. 3	9.75 @	10.00
Southern, No. 1, Soft	10.25 @	10.50
Southern, No. 2, Soft	9.75 @	10.00
Tennessee Charcoal, No. 1	15.00 @	15.50
Tennessee Charcoal, No. 2	14.50 @	15.00
Alabama Car Wheel	17.85 @	18.00
Jackson County Silvery	15.00 @	16.00
Other Ohio Silvery	13.00 @	13.50

The troubles in the Connellsville Coke region are the prevailing feature of the Pittsburgh market. Should the strike now under way be greatly prolonged it will necessitate the blowing out of a number of furnaces, and possibly cause an advance in the price of Iron. Foundry Iron is in light demand, No. 2 ruling at $10.50 @ $10 75, Pittsburgh. Quotations are as follows:

Neutral Gray Forge	$9.25 @	$9.50, cash.
All-Ore Mill	9.50 @	9.75 "
No. 1 Foundry	11 25 @	11.50 "
No. 2 Foundry	10.50 @	10.75 "
Bessemer	10.35 @	10.50 "

There has been some increase in the volume of business in Pig Iron during the week, which is seemingly the result of lower prices to consumers at Northern points, there having been a reduction in freight rates from Birmingham to the Ohio River of 50¢ ℔ ton and to some Northern and Eastern points of more than this. This has enabled the Southern furnaces to meet the competition of Northern furnaces on a more equitable footing. As a rule, prices of Pig Iron at the furnace have not changed. No. 2 Foundry is offered at $7 ℔ ton and No. 3 Foundry $6.50, f.o.b. Birmingham. A large part of the business during the week was for Iron delivered, and as it was not expected that the reduction in freight would be so large, rather better prices were obtained than could be now realized. There has been no movement in Charcoal Iron, and prices are nominal. Some sales of Coke Iron have been made for short forward delivery at the same prices as for spot delivery. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$10.50 @	$10.75
Southern Coke, No. 2	9.25 @	9.50
Southern Coke, No. 3	8.75 @	9.00
Ohio Soft Stone Coal, No. 1	14.50 @	15.50
Ohio Soft Stone Coal, No. 2	14.25 @	14.50
Lake Superior Coke, No. 1	13.00 @	13.50
Lake Superior Coke, No. 2	12.00 @	12.25
Hanging Rock Charcoal, No. 1	17.00 @	17.50
Hanging Rock Charcoal, No. 2	16.50 @	17.00
Tennessee Charcoal, No. 1	13.00 @	13.50
Tennessee Charcoal, No. 2	12.00 @	12 50
Standard Southern Car Wheel	16.25 @	17.00
Lake Superior Car Wheel and Malleable	16.50 @	17.00

Metal Market.

Pig Tin.—Prices have undergone an advance of about 30¢ ℔ 100 ℔, and the market has been very firm, although devoid of anything in the nature of speculative support. It is estimated that the spot stock in first hands is not to exceed 1200 tons. The monthly consumption is estimated at 1200 tons. Of the 1200 tons spot stock about 980 tons are in bonded warehouse. It would therefore appear that only 320 tons of Tin imported prior to the levy of the duty of 4¢ ℔ ℔ remain unsold. Since the duty went into effect 3326 tons have been imported. The present bonded stock of dutiable Tin is about 980 tons. On the face of

the returns it would appear that duty has been paid on about 2346 tons since July 1, 1893, and it is not improbable, considering the course of local market prices in the interval, that a loss was made on the greater portion. The market seems now to be shaping for more satisfactory results, and the movement in that direction would probably be more rapid but for the uncertainties attending tariff legislation. At the close the market was strong, with Straits quoted at 19.50¢ net, cash, for 5-ton lots, early delivery. Forward deliveries are held at a premium of 5¢ @ 10¢ per month ; 19.60¢ was paid for 1 carload. Meanwhile the requirements of consumers have not induced any marked expansion in the demand, which continues moderate. Small lots of Straits Pig are quoted at 21¢ @ 21¼¢ ℔ lb.

Copper.—Little, if any, change has taken place in the market for ingot during the past week. Business shows no improvement, and sellers have been more actively interested than buyers. Still it does not appear that this slight sign of anxiety to sell has weakened prices, although imparting somewhat uncertain tone to the market. Current quotations are 9¼¢ for Lake Superior Ingot, 9¼¢ @ 9⅜¢ for Electrolytic and 9¢ @ 9¼¢ for casting stock. Jobbing business is corrcspondingly slow, the demand for both Ingot and manufactured Copper being entirely disappointing. Retail prices for small lots are unchanged at former quotations.

Pig Lead.—The market has remained very quiet, and prices have averaged somewhat lower. Further than this there are really no facts to report, except that 3 40¢ is now a quite general selling price for common Western in carload lots. Regarding supplies little is said, but it is the general belief that an accumulation at primary points has taken place during the past two weeks. Jobbers and retailers complain of extreme dullness and indifference on the part of consumers. Prices are inclined to weakness.

Lead Sheet and Pipe.—There has been absolutely no improvement in the demand for these materials. Purchasing of plumbers' supplies is on the narrowest scale possible, consumers taking nothing beyond what is required to fill immediate needs. Business compares very unfavorably with former seasons.

Spelter.—Slow business and very indifferent demand have again been experienced, leaving the market in a flat, uninteresting condition. No pressure to sell has developed, however, and prices seem quite steady at 3.80¢ for ordinary Western brands, delivered here or at common points. One car, spot, was offered at 3.75¢ on the Metal Exchange. Statistically, however, the conditions for an advance in Spelter could hardly be better. There are at present 62 furnaces in operation west of the Mississippi River, in comparison with 122 furnaces at this time a year ago. In addition to this, over 95% of the galvanizing works in the country are in operation. Stocks everywhere are light; consequently an upward turn in prices seems to be only a question of time.

Antimony.—The demand is still of ordinary type and the market bare of new feature. Prices stand at about 8⅞¢ @ 9¢ for Hallett's and 10¢ @ 10⅛¢ for Cookson's, with the usual premium of about ¼¢ on small lots from store.

Nickel.—No change is reported, 40¢ being quoted as the going price.

Tin Plates.—At intervals there has been a fair trade in spot Plates and some manifestations of interest in futures; but, on the whole, the volume of business has been light in comparison with the general run at this season of the year and decidedly disappointing. Prices show no radical change, being at about the bottom level in all lines of Plates. The demand for Bessemer Cokes for the use of Southern canners, which should be exceedingly active at this time of the year, is particularly slack. This is partially accounted for by the damage done to the fruit crops and injury to growing vegetables by the recent severe weather. But tariff uncertainties havc also contributed materially to restrict purchases. Canners gcnerally are hanging on until the last moment before placing orders for what they will need this season, and they have about another month's leeway before they absolutely need to purchase. Meanwhile, stocks of imported Cokes are unprecedentedly short and but little stock is on its way to this country. Consequently, any large expansion of the demand would be difficult to meet. It is said, moreover, that the stock of Bessemer Cokes on the other side is by no means large. Roofing Plates are in fair average routine demand, which is easily met by the domestic manufacturers.

A special cable dispatch to *The Iron Age* from London, dated April 4, reports a fair business in 14 x 20 Cokes. Good orders had also been received for Black Plates. Liverpool quotations for Plates were as follows:

IC Charcoal, Alloway grade	12/ @ 12/3
IC Bessemer Steel, Coke finish	10/6 @ ....
IC Siemens " " "	11/ @ ....
IC Coke, B. V. grade, 14 x 20	Nominal
Charcoal Terne, Dean grade	10/3 @ 10/6

V. Clad & Sons, Philadelphia, Pa., issue for the season of 1894 an illustrated price-list of ice cream machinery. The pamphlet opens with a brief description, illustrations and price-lists of a variety of different styles of ice cream machines for hand and power, this section including freezer with steam engine attachments. The next goods noticed are ice breakers and freezers. Then come a variety of supplies. It is impossible to enumerate all the goods referred to in this pamphlet, but suffice it to say that it contains a most complete list of articles of this sort.

Chicago Report.

Scrap.—Very little is being done in anything but Cast Scrap. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5 ¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite. — Prices have been reduced 85¢ ℔ ton on the old schedule. Carload lots of 12 net tons or over are now quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill	$5.00	$5 25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6 55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

The estate of S. Whitnum (E. H. Little, manager), North Eleventh street and Driggs avenue, Brooklyn, N. Y., report that the past year has been the most prosperous one they have had. The firm, who are manufacturers and galvanizers of Leader Pipe, Kitchen Boilers, Sinks and Boiler Stands, have just put in a 40-ton cupola, and have increased their galvanizing department by an additional pot, making six in all. Their plant is very complete, being some 200 feet square, and having a capacity for galvanizing articles 20 feet in length.

John H. Blood, representing John McVoy & Co. and the Midland Steel Company of Muncie, Ind., with warehouse in Chicago, has opened an office in room 1141 Monadnock Building, Chicago, for the sale of Galvanized and Corrugated Sheet Iron and Sheet Steel.

M. L. Hull of Cleveland, Ohio, directs attention in his advertisement this week to various specialties, some of the claims for which are set forth in connection therewith. The assortment includes burners of various kinds, together with Plumbers' and Tinners' Furnaces.

CONDITION OF THE

Hardware Trade.

OUR ADVICES from the trade at large indicate on the whole a continued improvement in business, and in some of the trade centers there is a very fair volume of trade. In others the reports are not quite so satisfactory, but on the whole it is evident that there is a better demand for goods, which, it is expected, will continue with some increase as the season advances. The trade are still buying very carefully and limiting their purchases to their immediate requirements. They are influenced to continue this policy by the lack of strength in the market and the lower prices which have been developed in many lines. Collections afford little ground for complaint, and the financial condition appears to be on the whole satisfactory.

Advices from Chicago.—Orders for Shelf Hardware are now increasing in amount, showing a gradual improvement in the business of the country at large. The demand held up remarkably well last week in view of the severe storms and very cold weather which prevailed throughout the entire Northwest. The proportion of straight Hardware continues to grow larger, and jobbers look forward to a good trade during April from the way in which the month has opened up. The demand for staple goods is inclined to be quiet except Barb Wire, which is moving in a very satisfactory manner. The Heavy Hardware trade kept up last week to the average for the month, and March closed with a record fully equal to expectations. The trade for April has thus far shown a slight falling off as compared with the opening of March. Collections are steadily improving.

Notes on Prices.

Wire Nails.—The Wire Nail market is in a peculiar condition, inasmuch as notwithstanding the fact that the volume of business is good and most of the mills are well occupied on orders, prices are lower and the tone of the market not strong. The price is represented by the quotation of 95 cents to $1 for carload lots at mill. The fact that such prices are named is evidence of the active competition which exists among the manufacturers and their desire to keep their mills in operation. Some orders are being received from the large trade, and a good many smaller houses are taking advantage of the low prices prevailing and find that in many instances on fair lots they can purchase more advantageously from the manufacturers than through jobbing houses. Small lots from store in New York are held at $1.20 to $1.30.

Advices from Chicago.—Not much new business is reported by manufacturers' agents. Buyers are inclined to hold off and await developments, being very well stocked for the present. Quotations from factory are a shade under $1.10, Chicago, but the general price asked seems to be $1 at factory. Freight rates vary according to the location of the establishment. Small lots from stock are now selling at $1.15 to $1.20.

Cut Nails.—The price of Cut Nails in the Eastern market is somewhat unsettled, as the desire to keep their mills in operation has had the effect of inducing lower quotations by the manufacturers than prevailed a month or two ago, and at the same time they are feeling the effect of Western competition to a certain extent. Western Nails are being offered delivered in New York and other Eastern points at 95 cents to $1 base, and it is intimated that these figures have been shaded in some cases. Small lots from store in New York are held at $1.10 to $1.15, slight concessions being made on larger lots.

Advices from Chicago.—A report was circulated widely last week that the Lake Side Nail Works had shut down for lack of orders. This report was false. The works are in full operation with no immediate prospect of closing. Manufacturers report a very fair volume of business for the week. The market, however, was disturbed by the appearance of Ohio River manufacturers, who made very low quotations in the hope of securing a share of the Chicago business. Regular rates are still $1 on 55 cent average. Small lots are quoted at $1.10 from stock.

Barb Wire.—There is little change in the condition of the Barb Wire market, the demand continuing excellent and prices being on the whole well maintained. The regular quotations of the manufacturers are as follows on Four Point Galvanized: Pittsburgh, $2.15; Cleveland, $2 20; Cincinnati or Allentown, $2.25; Chicago or New York, $2.35.

Advices from Chicago.—Nothing new has occurred in this line. Manufacturers appear to be in excellent shape, with sufficient business on hand and daily being received to hold prices up to the figures recently quoted and maintained. Carload lots of Galvanized are selling at $2.25 to $2.30, and small lots from stock are quoted at $2.35 to $2.40.

Cordage.—The Cordage market is in an unsettled condition, and lower prices have been developed. Last week a leading outside concern made a quotation of 6 cents base on Manila Rope, which had the effect of bringing down the prices of other manufacturers, some of whom are selling at this price, while others refuse to name lower than 6¼ cents. The latter figure is regarded as representing the market at this time, though it is intimated that slight concessions may be obtained. Sisal is being sold at 4¼ cents base, and there is little difficulty in obtaining the goods at this price. New Zealand is also quoted at 4¼ cents base. Rumors are current in regard to impending changes in the management of the United States Cordage Company, and it is understood that negotiations are still pending with a view to the identification of the Good interests with those of the company. What the outcome may be is uncertain, but it would not be surprising if there were some developments of interest within a short time.

Stove Bolts.—The base discount on Flat and Round Head Stove Bolts has been made 65 per cent. instead of 60 per cent. as heretofore.

Bay State Rivets.—In their discount sheet, April 2, American Screw Company, Providence, R. I., quote Bay State Rivets ⅘ cent net per pound less than Norway Rivets, instead of by list and discount as heretofore.

Sheet Zinc.—Under date March 27, Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue revised discounts on Sheet Zinc. The price remains $4.50 per 100 pounds in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The extras are also unchanged. The revised discounts are as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	9	9	9	9
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	15	14	13	12

All discounts are computed straight when money accompanies the order. Quantity discount is added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly subject to the quotation of the class to which it belongs.

Furnace Fittings.—Under date of April 1, 1894, the Carton Furnace Company, Utica, N. Y., and Chicago, Ill., issue a special net trade price-list of Furnace Fittings. These Tin Plate Fittings, they announce, are made of best quality of IX prime, full weight, charcoal bright Tin Plate, and the Gal-

vanized Iron Fittings are made of best Bloom Galvanized Iron. All are hand made. We reprint below the prices on Round Hot Air Pipe, Register Boxes and Elbows:

Round Hot Air Pipe.

Inch.	Per foot.
7	$0.10
8	.11
9	.14
10	.16
12	.18
14	.28
16	.30
18	.35

Register Boxes. (Floor.)

	Each.
8 x 10	$0.27
8 x 12	.28
9 x 12	.30
9 x 14	.32
10 x 12	.33
10 x 14	.35
12 x 15	.45
14 x 18	.60
16 x 20	.70
18 x 24	.90

Elbows. (Hot Air.)

Four Piece.

7	$0.25
8	.27
9	.30
10	.32
12	.42
14	.54
16	.77
18	.95

Prices are also given on Square Pipe, hot air; Square Pipe Elbows, regular; Square Pipe Elbows, flat; Square Pipe Tees, regular and flat; Square Pipe Offsets, regular and flat; Boots, regular pattern, flat back; Boots, center pattern, round; Boots, offset; Floor Register Heads; Side Wall Register Heads, square and circular top; Double Side Wall Register Boxes, square and circular top; Furnace Collars for flat and pitch casing tops; Hot Air Pipe Dampers and Clips, Safety Thimbles, Galvanized Iron Smoke Pipe, Galvanized Iron Smoke Pipe Elbows; Check Damper Tee Pieces, Galvanized Iron; Common Smoke Pipe Dampers and Check Dampers, Cast Iron.

These Fittings are also furnished, covered with the best quality of asbestos paper, for 20 per cent. additional to the net prices. Terms are net cash, 30 days from date of invoice. No discount is allowed at settlement.

Yates' Astringent Lacquer —Yates & Co., Rockford, Ill., are furnishing Yates' Astringent Lacquer to dealers for making paste stove polish in large or small quantities and at a very low price; also avoiding the trouble with the variation that may occur in the quality of paste polish after it has been in a can any length of time. The point is made that a dealer can thus mix, without heat, any grade of paste polish in a short time, saving the cost of manufacturing, canning and packing. It is pointed out that the lacquer can be used for making liquid stove polish, rust proof varnish, rust proof paint for roofs, soldering flux, &c. The lacquer is put up in from 2 to 10 gallon cans, and sold at the following net prices:

	Per gallon.
2 and 3 gallon cans	$1.25
5 and 10 gallon cans	1.00

Glass.—If there is any change in the condition of the Glass market, it is encouraging for manufacturers rather than otherwise. Local jobbers report a fair business for the month of March and a tendency toward firmer prices. There is a feeling among representative manufacturers and jobbers that the prices which have ruled for the past month or more should not continue indefinitely. This is indicated by a rather informal meeting of Glass men held at Pittsburgh a week or two since, at which the situation was reviewed; also by a meeting recently held at Marion, Ind., by Glass manufacturers. While the objects of the meetings were not divulged, it is understood that the discussion related to existing prices. It is also understood that the Western manufacturers met entirely independent of those of Pittsburgh or other Glass districts.

Old Metals.—There is rather more business doing in Old Metals, but it is on a strictly conservative basis. Prices continue low. In the case of some grades of Scrap Iron, however, it is said that dealers have been able to get a little more money. Inquiries are somewhat more numerous. The following quotations represent dealers' purchasing prices in New York:

Heavy Copper	℔	7¢
Light and Tinned Copper	℔	6¢
Heavy Brass	℔	5¢
Light Brass	℔	4¢
Lead	℔	3¢
Tea Lead	℔	2½¢
Zinc	℔	2¼¢
No. 1 Pewter	℔	13¢
No. 2 Pewter	℔	6¢
Wrought Scrap Iron, gross ton	$7.50 @	$8.50
Heavy Cast Scrap, gross ton	7.00 @	8.00
Stove Plate Scrap, gross ton	4.00 @	5.00
Burnt Iron, gross ton	3.50 @	4.00

Old Rags, Paper, &c.—Prices for these materials show but little improvement, and the demand does not broaden to any extent. Quotations are nominally as follows:

No. 1 White Rags	℔	3¼ @ 3½¢
No. 2 White Rags	℔	2¼ @ 2½¢
Mixed Rags	℔	⅞¢
Blues and 3ds	℔	1 @ 1¼¢
Hard Sized White Shavings	℔	2¼ @ 2½¢
No. 1 White Book Shavings	℔	2 @ 2⅛¢
No. 2 White Book Shavings	℔	1 @ 1⅛¢
Light Book Shavings	℔	⅞¢
No. 1 Mixed Shavings	℔	⅞ @ 1 ¢
No. 2 Mixed Shavings	℔	½ @ ⅞¢
No. 1 Printed Books	℔	1 @ 1¼¢
Ordinary Mixed Books	℔	½ @ ⅞¢
Newspapers	℔	2-5 @ ½¢
No. 1 Manila Paper	℔	1 @ 1⅛¢
No. 2 Manila Paper	℔	⅜ @ ⅞¢
Bogus Paper	℔	½¢
Common Paper	℔	⅜¢
Straw Chips	℔	½¢
Binders' Clippings	℔	½ @ ⅝¢
Jute Butts	℔	1⅞ @ 2 ¢
No. 1 Jute Bagging	℔	1 @ 1¼¢
Mixed Bagging	℔	⅞ @ 1 ¢
No. 2 Bagging	℔	½ @ ⅞¢
Hemp Twine	℔	2 @ 2¼¢
Manila Rope	℔	2¼ @ 2⅜¢
Jute Rope	℔	1½ @ 1⅝¢
Mixed Rope	℔	⅞ @ ⅞¢

Old Rubber.—The market for Old Rubber shows some improvement, but prices are somewhat irregular. The following quotations represent approximately those given by dealers in this city:

Car Springs, ton lots, ℔	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔	@	.03½
Rubber shoes, less than carloads, ℔	@	.03¼
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔	@	.03⅝
White Syringes, ℔	@	.03¾

Trade Notes.

THE UNION SOAPSTONE WORKS, 14 Marshall street, Boston, Mass., issue circulars illustrating and giving prices of their various Soapstone articles. The cuts show Laundry Tubs, Sinks, Drainboard Sinks, Foot Warmers, Griddles, &c. Full lists of sizes and prices accompany the illustrations.

AMONG THE MANUFACTURERS who have given special attention to perfecting the quality of Galvanized Sheet Steel Ware are the Geuder & Paeschke Mfg. Company, Milwaukee, Wis., whose trade in this line has extended all over the United States. The goods are made of Sheet Steel of the best quality, and after the articles are completed they are immersed in a bath of molten slab zinc, which effectually closes all seams and makes the ware proof against rust and leakage.

THE STAR MILK COOLER COMPANY, Haddonfield, N. J., have shipped to Stephen Francisco, Caldwell, N. J., the largest Milk Cooler that they have ever built. The apparatus is 11 feet high, 6 feet 6 inches wide and weighs 1000 pounds. It has a capacity to reduce the temperature of 20 quarts of milk per minute from 98° to within 2° of the spring water used as the refrigerant, which is forced through the machine by a steam pump. This Cooler was selected by a number of the leading physicians of Newark, East Orange and Orange, to co-operate with the Board of Health of Newark to improve the condition of the city's milk supply.

KIECKHEFER BROS.' tinware factory in Milwaukee, Wis., was slightly damaged by fire on the night of the 28th ult. While the loss was trifling and the fire caused no interruption to business, it was attended with a most lamentable accident. When it had been extinguished, the body of the night watchman was found in the japanning room. The supposition is that he was knocked senseless by an explosion, and was then suffocated before the firemen discovered him.

DONLON & MILLER MFG. COMPANY of Brooklyn, N. Y., were incorporated at Albany last week, to deal in gas and electric fixtures. The directors are John Donlon, Arthur S. Miller, John F. Miller of Brooklyn, and others. Capital, $50,000.

THE CITY OF NILES, OHIO, has voted $10,000 for the purchase of a site and for a bonus to the new Sykes sheet mill to be built there at a cost of $100,000, and to employ 75 men. They will manufacture sheets for roofing purposes.

REPAIRS on the sheet mill engine being completed, the mills of the Reeves Iron Company, Canal Dover, Ohio, have resumed operations.

IT IS ANNOUNCED that the sheet mills of the Newport Rolling Mill Company, Newport, Ky., will resume operations this week after a shut down of several weeks. The heavy assorted stocks usually carried by this company have been depleted and a steady run is expected.

REPORTS are current to the effect that Raymond G. Sykes of Niles, Ohio, and

James Ward of Newcastle, Pa., are interested in the project to start the sheet rolling mills at Joliet, Ill.

While many believe that an early return to the normal conditions of business is improbable, yet there are concerns who find much encouragement in the outlook for the near future. The E. W. Bliss Company of Brooklyn are erecting in their works two of the largest and heaviest presses which they make—viz., their Nos. 14 and 15 Toggle Drawing Presses. The former weighs about 140,000 pounds, and is driven by an engine attached to it. It is about 14½ feet in hight and has a width between the uprights of 54 inches and will draw articles up to 11 inches in depth. It can be started or stopped at any point in the stroke by means of a friction clutch. These Presses are used in drawing up such articles as kitchen boiler heads, cylinders, steel sinks, heavy black iron and enameled ware. The press is to be shipped in about a week to England to be used in drawing up heavy steel shells. The No. 14 Press is somewhat lighter, weighing about 75,000 pounds, having a distance be tween the uprights of 30 inches, and will draw articles in depth up to 10½ and 12½ inches. This Press, while it will draw articles of greater depth, has not the requirements for doing nearly as heavy work as the No. 15 Press. This Press is being built for one of the large tinware stamping concerns in this country for drawing up heavy enameled iron ware of various descriptions.

E. T. Barnum, Detroit, Mich., has furnished for the Alpena National Bank, Alpena, Mich., the grill work for their newly arranged offices. It consists of flat twisted metal in square mesh, riveted at each intersection with scroll border, having scroll pickets on top. All the work is electro plated in antique copper finish.

Bruce Smith & Clarence Brewster, Middletown, Conn., have begun the manufacture of their recently invented Water Filter. The Filter is reversible and embodies some new features.

The Pittsburgh Reduction Company of Pittsburgh, manufacturers of pure Aluminum, have fitted up a large room in the Ferguson Block in that city, in which is shown a large number of articles made of Aluminum. Cooking and other culinary utensils, toilet articles and fine art castings form a part of the interesting display.

Kraushaar Lamp & Reflector Company, St. Louis, Mo., have removed to 2510 and 2512 North Eighth street. The specialties which they manufacture consist of Car Trimmings, Headlights, Lamps, Street Railway Brass Work, &c.

We receive from Josiah M. Read, 63 Blackstone street, Boston, Mass., circulars of the different styles of sliding dampers manufactured by him for controlling the draft of air in pipes. Their use in connection with stoves and furnaces is commended by a number of testimonials.

A substantial find of gold is reported from Virginia, a town in the Mesaba range, St. Louis County, Minn. The discovery is said to have been made accidentally while explorations for iron ore were being conducted on property owned by P. J. McCann. West Superior capitalists have become interested in the matter.

SCRAP.

The Phillips Tin Plate Company, Philadelphia, are putting in a new tinning machine of the Phillips type specially for best and ordinary coke finish plates. This will make an equipment of five sets, three of which will be employed on ternes, one on best charcoal tins and one on best and common coke finish tin plates. The firm are also adding to their plant a new and economical automatic pickling machine built by Newbold & Son of Norristown, Pa.

Norton Brothers, manufacturers of tin and sheet metal goods, whose Chicago factory was recently burned, have decided to concentrate their manufacturing operations at Maywood, Ill. They require much greater facilities than they now have at that place, and propose to add considerably to the plant. The new building will probably cost $200,000 and will be located on the south side of the Northwestern Railroad and extend from Sixth to Eighth or Ninth avenue. Plans for the new structure have been completed by Frederick R. Schock, and bids for its construction are being received. The building will be constructed in the shape of a hollow square covering an area of 243 x 243 feet, two stories high. It will extend to a depth of 72 feet to an inner court, and in center of this a boiler house, 30 x 40 feet, will be constructed. In this court will be a one-story section on both sides of the boiler house for the use of employees. On the side of the main structure there will be an annex 21 x 155 feet. The interior of the building will be of mill construction throughout and will be provided with elevators. The exterior will be constructed of pressed brick, relieved by stone trimmings, and will be ornamented by two towers.

The Ellwood Tin Plate Company, Ellwood City, Pa., have been granted a charter, with a capital stock of $10,000. The directors are A. W. Brown, Cambridge, Ohio, H. W. Bishop, Cleveland, Ohio, and R. C. Aiken, North Sewickley, Pa.

The Chicago Tin Plate Mfg. Company, whose works are located at Fortieth street and Wentworth avenue, Chicago, have opened a city office at Room 583, The Rookery. All purchases of material and sales of product will in future be made from the city office. The company have made steady progress since their establishment in June of last year. They report their tin and terne plate as giving so much satisfaction that they cannot meet the demand and are therefore arranging to at once put in additional cleaning and tinning machines.

N. E. Whitaker of the Whitaker Iron Company, Wheeling, W. Va., in association with some friends, is contemplating the erection of a tin plate manufacturing plant. The matter will, however, depend largely on the outcome of the tariff bill now before Congress. Washington, Pa., is mentioned as the probable location of the works.

A paragraph has been going the rounds of the daily press which states that a number of New York capitalists have organized a syndicate and completed plans for the erection of one of the largest tin plate plants in the country. The syndicate is said to have a capital of $300,000 to spend on the establishment of the plant, which, says the report, is to employ, when completed, 800 men. The citizens of Washington, Pa., are said to be anxious for the location of the new works in that town, and to have expressed their readiness to take shares in the concern. Inquiries made in New York elicit the fact that there is a foundation of truth in the above report, although some of the details given are premature. A number of persons of prominence in the iron and metal trades are forming plans for the establishment of a large tin plate works, but the carrying out of the project will largely depend on the course of tariff legislation. The place of location is not, however, yet decided on, nor have any definite plans been yet completed.

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Metal and Miscellaneous Prices.

CHICAGO, APRIL 5, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Vallandand MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14x20	@ 7.25
E.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal ,extra. IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28	@$11.25
Crescent, IC, 20 x 28	@ 11.75
Crescent, IX, 20 x 28	@ 14.75
Empire, IC, 20 x 28	@12.00
Empire, IX, 20 x 28	@15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated),IC,20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28	@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28	@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$23.60
Westmoreland :	
IC, 14 x 20	$5.87½
IC, 20 x 28	11.75
Elwood :	
IC, 20 x 28	$11 75
Juno :	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method :	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie :	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process :	
IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style :	
IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 4-10¢	3 ¢
17 to 20	℔ 2 5-10¢	3 1-10¢
21 to 24	℔ 2 6-10¢	3 2-10¢
25 and 26	℔ 2 7-10¢	3 3-10¢
27	℔ 2 8-10¢	3 4-10¢

Russia, Planished, &c.

Gennine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9¼¢
dis. 5%
Craig's Polished Sheet Steel.....8¼¢

Galvanized.

Juniata or first quality.....dis.75%

Copper—

Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.

(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu	35¢
Plain, above 3 inch	45¢
Plain, 5-16 inch	45¢
Plain, ¼ inch	60¢
Plain, 3-16 inch	$1.00
Plain, ⅛ inch	$1.50
Fancy Tubing, Brass, to No. 20 incl	43¢ ℔
Bronze Tubing, 3¢ ℔ more than Brass	

40 @ 45%

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12½¢@12¾¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11¼¢@11½¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	60%
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles :	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ ℔, 2 ¢
" " Brown	℔ ℔, 1½¢
" " Purple	℔ ℔, 2½¢
" Ground in oil, B. Red	℔ ℔, 6½¢
" Ground in oil, Red	℔ ℔, 6½¢
" Ground in oil, Brown	℔ ℔, 5½¢
" Ground in oil, Purple	℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls., ℔ gal	36½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, APRIL 6, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots :

Small lots	℔ ℔, 75¢
100-℔ lots	℔ ℔, 73¢
Ton lots	℔ ℔, 70¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting :

Small lots	℔ ℔, 70¢
100-℔ lots	℔ ℔, 65¢
Ton lots	℔ ℔, 60¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting :

Small lots	℔ ℔, 65¢
100-℔ lots	℔ ℔, 60¢
Ton lots	℔ ℔, 55¢

Antimony—

Cookson.....℔ ℔, 10¾¢
Hallett's.....℔ ℔, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

List May 20, 1889.

	Per ℔.
Plain, to No. 20 inclusive, above 5-16 inch to 3 inch inclusive	$0.35
Plain, to No. 20, above 3 inch	45
Plain, 5-16 inch to No. 20	45
Plain, ¼ inch	60
Plain, 3-16 inch	1.00
Plain, ⅛ inch	1.50
Fancy Tubing to No. 20, inclu	43

25@30%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Bronze, Tobin—

Drawn Rods for Bolts, Forgings, &c

Over ¼ to 3½ inches inclusive....17¢ ℔ ℔
Over 3⅛ to 5 inches inclusive.....18 ℔ ℔

Piston Rods, Finished True, Smooth and Straight.

Over ¼ to 3½ inches inclusive....18¢ ℔ ℔
Over 3¼ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1,25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ℔ ℔, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9¼¢
Planished......net
Sheet and Bolt.....15¢ ℔ ℔, net, basis

Tubes — See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering,* in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.60	2.90¢
Nos. 17 to 21	℔ ℔. 2.70	3.00¢
Nos. 22 to 24	℔ ℔, 2.80	3.10¢
Nos. 25 and 26	℔ ℔. 2.90	3.20¢
No. 27	℔ ℔. 3.00	3.30¢
No. 28	℔ ℔, 3.05	3.40¢
American B. B	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11¾@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 6%
Craig Polished Sheet Steel.....℔ ℔ 3½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@76&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Filter Joints—

Lee's.....33⅓%

Lead—

American Pig	3¾¢@4¢
Bar	4¼¢
Pipe	5¾¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6½¢, 20%

Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7¼
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1¼
Red Venetian, American	1¼ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .43

Spirits Turpentine:
In bbls..... @ .32

Putty:
In barrels and ½ bbls..... .01½ @ .01¾
In tubs..... .01¾ @ .01¾
In tin cans..... .01½ @ .02½
In bladders..... .01¾ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton..... $30.00@$35.00
Asphaltum, Rock, ₩ ton..... $14.00
Coal Tar Felt, 1 Ply, ₩ ℔..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive..... 60@60&10%
Other sizes..... 55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches..... 60@60&10%
Other sizes..... 55@55&10%

Pipe, Spiral—

Galvanized..... 60%
Tin..... 60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D..... ₩ bbl. $1.19@$1.20
Rosin, E. & F..... ₩ bbl. $1.30@$1.45
Rosin, G. & H..... ₩ bbl. $1.65@$1.90
Rosin, I. & K..... ₩ bbl. $2.25@$2.60
Rosin, M. & N..... ₩ bbl $2.80@$3.00

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr..... $3.25@$4.50
Pen Argyle, ₩ sqr..... 3.50@ 4.25
Peach Bottom, ₩ sqr..... 5.00@ 6.25
No. 1 Chapman, ₩ sqr..... 4.00@ 4.65
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.70@ 3.20
Purple, ₩ sqr..... 3.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

⅛ & ¼..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔..... 4¢
Smaller quantities, ₩ ℔..... 5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔..... 2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
8bls., about 500 ℔, ₩ ℔..... 3½¢ } 5% dis.
½ bbls., about 300 ℔, ₩ ℔..... 4¢ }
Kegs, about 110 ℔, ₩ ℔..... 4¢ }
75¢ extra for keg. }
Kegs, about 55 ℔, ₩ ℔..... 4¢ }
Yager's Soldering Salts.
¼-℔ bottles, each..... 30¢
Large quantities, per ℔..... 40¢

Spelter—

Western Spelter..... 4½¢@4½¢
Bertha (pure)..... 8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 21¾¢
Straits, pigs, ₩ ℔..... 21¢ @ 21¼¢
Straits in bars, ₩ ℔..... 22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20..$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20.. 6.75
" " " IX, 14 x 20... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dane, IC, 14 x 20..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28..... 12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 6.12½
Extra Central, IC, 14 x 20..... 5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28..... 11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20.. 6.25
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20..... 9.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... 12.00
" IX, 20 x 28..... 15.00
Newcastle Real Old Method, IC, 14x20, 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20..... 5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20..... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20..... 5.37½
Vigilant, IC, 14 x 20..... 5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... $6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20..... 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25
Versailles, IC, 14 x 20..... 5.75
Youghiogheny, IC, 14 x 20..... 6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20..... $7.50
20 x 28..... 15.00
IX, 14 x 20..... 8.75
20 x 28..... 17.50
Pontymister Grade, IC, 14 x 20..... 6.50
20 x 28..... 13.00
IX, 14 x 20..... 7.50
20 x 28..... 15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28..... 11.50
IX, 14 x 20..... 6.75
20 x 28..... 13.50
Dean Grade.—IC, 14 x 20..... $5.37½
20 x 28..... 10.70
IX, 14 x 20..... 6.40
20 x 28..... 12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28..... 10.50
IX, 14 x 20..... 6.40
20 x 28..... 12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.
Melyn and Calland Grade. IC, 10 x 14..... $6.37½
" " IC, 12 x 12..... 6.62½
" " IC, 14 x 20..... 6.37½
" " IC, 20 x 28..... 12.75
" " IX, 10 x 14..... 8.00
" " IX, 12 x 12..... 8.25
" " IX, 14 x 20..... 8.00
" " IX, 20 x 28..... 17.00
" " DC, 12½ x 17..... 6.00
" " DX, 12½ x 17..... 8.00
Allaway Grade. IC, 10 x 14..... 5.75
" " IC, 12 x 12..... 5.87½
" " IC, 14 x 20..... 5.75
" " IC, 20 x 28..... 11.50
" " IX, 10 x 14..... 7.00
" " IX, 12 x 12..... 7.25
" " IX, 14 x 20..... 7.00
" " IX, 20 x 28..... 14.00
" " DC, 12½ x 17..... 5.50
" " DX, 12½ x 17..... 6.60
Coke.
Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20..... 8.12½
20x28..... 11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates

IXX, 14x26..(112 sheets)..... $13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper..... net

Tubing—

Tin..... 55%
Galvanized..... 55%

Brass and Copper.—

Standard List..... 35@40%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.... $18.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz..... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 4¾¢
Per ℔..... 5¼¢ @ 5½¢

It Is Reported—

Delaware.

That J. H. Cleaver, late of the firm of Cleaver & Hearn, Stove dealers, WILMINGTON, has opened a store with a full line of Stoves and Tinware at 6 East Fourth street.

Illinois.

That J. B. Watson's Hardware store at BARRY was destroyed in a large fire at that place March 30.

That Boutwell & Schad have recently opened a new Hardware store at LAKE VILLA.

That Patterson & Moss, late of DANVILLE, have leased two large rooms in the Haworth Block, DECATUR, where they will establish a wholesale Hardware house, carrying a stock valued at $25,000.

Indiana.

That the H. Lundt Hardware & Roofing Company have recently commenced business at HAMMOND.

Indian Territory.

That the Turner Hardware Company, MUSCOGEE, have commenced the erection of a large new building, which they will occupy on completion.

Iowa.

That Smith Bros.' Hardware store, at SHELDON, was damaged by fire on the 21st ult.

That E. S. Carson has entered the Hardware business at LACONA, having purchased one of the Hardware stocks at that place.

That C. E. Foster, lately of STANBURY, MO., has located at CINCINNATI, where he will engage in the Hardware and Implement business.

That Bailey & Ford is the style of a Hardware firm recently formed at DUNCOMBE.

That L. Parrish recently disposed of his interest in the Hardware business, at GLENWOOD, to his partner, Frank Gigray, and is now traveling for a dry goods house.

That the Implement store of Carter & Shakers, EL DORA, was destroyed by fire on the 19th ult.

Louisiana.

That the capital stock of the C. A. Brusle Hardware Company, PLAQUEMINE, has been increased from $10,000 to $25,000.

Maine.

That Alger Munsey has opened a Stove and tinsmith store at WISCASSET.

Michigan.

That Adam Wagner has opened a new Hardware store at his old stand at UTICA.

That Jilbert & Lang will soon open a new Hardware store at HOUGHTON.

That Mr. Gray of LEONIDAS has purchased G. Baldwin's Hardware stock and is now conducting the business.

That Frank E. Hixson of WEST BAY CITY has purchased the interest of Asa Newman in the Hardware firm of Newman & Kennedy, PORTLAND, and the style of the firm has become Kennedy & Hixson.

That A. D. Banker, GRAND BLANC, has sold a one-half interest in his Hardware and Implement business to Charles M. Stuart. The business will hereafter be conducted under the style of A. D. Banker & Co.

Minnesota.

That Andrew Byram of REDWOOD FALLS will soon enter the Hardware business at AUSTIN.

That Henry Nelson has purchased the Hardware stock of P. Lier, ASHBY.

That A. E. Johnson has bought the Hardware store of A. B. Hansen & Co., on Second street, HASTINGS, and will hereafter conduct the business under his own name.

That thieves entered the Hardware store of Otto Kaupp & Son, BLUE EARTH CITY, on the 18th ult., and breaking open the safe abstracted $15 in cash and a gold watch. A drawer in the safe containing $90 was overlooked.

That the large fire at COKATO on the 20th ult. destroyed the Hardware store of P. O. Hamburg; loss, $6000: insurance, $3000.

That Schneider Bros. have opened a new Hardware store at ADAMS.

That Horn Bros. of DELAVAN have sold their Hardware store to Shoen & Herring.

That Newton & Parks have disposed of their Hardware stock at TRACY to D. H. Evans.

That H. O. Monson & Co., Hardware merchants of WHEATON, have gone out of business.

That B. F. Turnbull will soon open a Hardware store at RAINY LAKE CITY.

That Bronson & Son of LUVERNE have disposed of their Hardware and Farm Machinery business to Elmer Huntington.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A good boy between 16 and 18 years of age to learn the tinning and plumbing trades; one who will serve for three years; $30 a year, board and washing; good home for a good boy. A. M. Kreider, Lititz, Pa. Apr. 7

A good all round TINSMITH, with some knowledge of plumbing; temperate and industrious; to the right party a steady position is open; state wages expected. 545 Main street, Niagara Falls, N. Y. Apr. 7

By a tin plate and metal house, a first-class SALESMAN who thoroughly understands tin plates, sheet iron, brass and copper goods, to travel in the West. Address, with references, P. O. Box 1530, Philadelphia, Pa. Apr. 7

A capable man, to take charge of a steel range plant; one that is familiar with sheet steel work, mounting, &c., and who can command a few thousand to interest himself with the company; patterns, tools, &c., are all new; to such a person we will make a liberal proposition; references furnished and expected. "Steel Range," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

A competent PLUMBER; one that has some knowledge of tinning and spouting; must be strictly temperate; state experience and wages expected. Parrish Bros., Great Barrington, Mass. Apr. 7

A man who is informed in the practice and theory of PLUMBING, HEATING and VENTILATION, and who has sufficient literary ability to write for a trade journal. The Colliery Engineer Company, Scranton, Pa. Mar. 31

CLERK for iron foundry; one who has had experience in keeping time, cost and piece workers' accounts. "Clerk," P. O. Box 1086, Philadelphia. Mar. 31

A first-class, experienced TRAVELING STOVE SALESMAN for Wisconsin. Addresss by mail Detroit Stove Works, Chicago, Ill. Mar. 31

A good TINSMITH with about $1000 to invest; references required. P. O. Box 743, Geneva, N. Y. Mar. 31

A good SLATER; one who understands tin roofing; state salary expected; write at once. Wagner & Clemens, 505 Second street, Defiance, Ohio. Mar. 31

A competent PLUMBER; one used to country work preferred; to a man that is not afraid of doing a good day's work steady work and fair wages will be paid; state experience and wages expected. Burbank, Studd & Metze, Berlin, N. H. Mar. 31

A practical TINSMITH, a ready man on all kinds of job work, furnaces, &c.; one with some knowledge of plumbing; state age, experience and wages expected. Burbank, Studd & Metze, Berlin, N. H. Mar. 31

SITUATIONS WANTED.

By a thoroughly experienced MANAGER with long foundry experience; successful in establishing and running foundry agencies, wholesale and jobbing houses; bookkeeper and salesman. "Successful," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

A steady position by a competent STEAM and HOT WATER FITTER; one that is well versed in theory and practice; an accurate draftsman and estimator; can give references; married; eight years' experience; age 27; at present am employed, but position don't suit me; I also understand and can do a good job of plumbing. "F. R. C. E.," 608 Hayes avenue, Sandusky, Ohio. Apr. 7

By a man with good mechanical ability; ten years' experience in TIN and SHEET IRON WORK; thoroughly understands house heating by steam, hot water and hot air; can lay out, estimate and do work from architects' plans; am strictly temperate and reliable. J. P. Lisk, 636 Monroe street, Brooklyn, N. Y. Apr. 7

By a TINNER; 26 years of age; seven years' experience in assortment; tin roofing, iron pipe work; all kinds of jobbing; furnace work a specialty; married; strictly temperate; can give good references. Willard B. Wilson, Belfast, N. Y. Apr. 7

By a good TIN and SHEET IRON WORKER; well experienced, a steady position desired, city or country. A. Schapiro, 195 Forsyth street, New York City. Apr. 7

By a first-class TINSMITH, COPPER WORKER and TINNER; bathtub lining a specialty; A1 reference. Geo. Orolowitz, 529 Bainbridge, Philadelphia, Pa. Apr. 7

A first-class TINSMITH, 16 years' experience at inside and outside work; country preferred. M. Newberger, 134 Orchard street, New York City. Apr. 7

By a good TIN and SHEET IRON WORKER; city or country. "Tinner" care of Jacob Trick, 61 Jackson street, New York City. Apr. 7

By a young man of 30 (Norwegian), with eight years' experience at plumbing, piping and tinsmithing in country shop; steady and sober. Edward Erickson, Box 167, Berlin Hills, N. H. Apr. 7

By a first-class CORNICE MAKER, CUTTER and RAISER; will work at bench; 20 years' experience; five years as manager of cornice, tinning, plumbing and steam fitting shop; good rustler; sober and industrious. Box 324, Deadwood, S. Dak. Apr. 7

By a first-class TIN, COPPER and SHEET IRON WORKER, 28 years of age, 13 years' experience in hotel work. James Ambrose, 117 North Second street, Philadelphia, Pa. Apr. 7

By a first-class all around TINNER and FURNACEMAN; long experience; can do iron pipe and heavy sheet iron work; can take charge of shop or business. Box 324, Deadwood, S. D. Apr. 7

By a first-class PLUMBER and STEAM FITTER; sober and industrious. R. N. Osborn, Deadwood, S. D. Apr. 7

By a practical TIN and SHEET IRON WORKER; 20 years' experience on assortment or can work; city or country. George Laird, 186 Tenth street, Brooklyn, N. Y. Apr. 7

By a first-class PLUMBER; city or country. E. C. Smith, 206 East Sixty-third street, New York City. Apr. 7

By a TINSMITH 22 years of age: seven years' experience; understands plumbing; steady job desired; city or country. "O. F.," 216 East Fourth street, New York City. Apr. 7

By a practical CORNICE and SKYLIGHT MAKER, first-class cutter, and well up in drafting; can do all kinds of hammer work by hand; not afraid to work; thoroughly understands the business inside and outside; capable to take charge of shop; can give good references; steady position desired with some good firm. "Cornice Maker," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

Steady work by a good TIN and SHEET IRON WORKER accustomed to roofing, pump work and all kinds of tin work and general jobbing. C. Jeffery, 186 Ohio avenue, Providence, R. I. Apr. 7

A practical and strictly first-class PLUMBER, no botch, desires work in city or country; near New York; 18 years' experience; neat lead worker and understanding plans thoroughly. E. Usher, 427 East 114th street, New York City. Apr. 7

By a first-class TINNER and CORNICE MAKER; some experience at plumbing; inside and outside work. Wm. Winter, 298 Pembroke street, East Bridgeport, Conn. Apr. 7

First-class TIN and SHEET IRON WORKER on ranges, heaters and general jobbing inside and outside, as well as a good practical PLUMBER, GAS and STEAM FITTER, and fully up on pump work, hot water and steam heating and ventilating, by a man of middle age; fully competent to estimate on any branch of the business; honest, sober and reliable with A1 reference in New York. John Pearce, Mt. Morris Hotel, 130th street and Third avenue, New York City. Apr. 7

By a TINSMITH, FURNACEMAN and GENERAL JOBBER; some knowledge of plumbing; married; temperate; steady worker. "Steady Worker," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

By a first-class PLUMBER; city or country. Charles Blake, 2348 North Thirty-first street, Philadelphia, Pa. Apr. 7

By a first-class PLUMBER. John Falihee, 2234 First avenue, New York City. Apr. 7

As PLUMBER by a practical mechanic; nine years' experience; industrious and trustworthy. P. McGee, 192 Mallory avenue, Jersey City, N. J. Apr. 7

By a young man as COPPERSMITH; two years' experience on steamboats; city or country; good workman. H. Sheft, 189 Chrystie street, New York City. Apr. 7

By a first-class TINSMITH; New York State preferred; understands the business in all its branches; married man and strictly temperate. Christopher Quinn, 102 Davis avenue, West New Brighton, Staten Island, N. Y. Apr. 7

In the country, by a young man, 24 years of age, as TIN ROOFER and JOBBER; sober and industrious; wages moderate. John Eshenfelder, 88 Sumpter street, Brooklyn, N. Y. Apr. 7

By a first-class CORNICE CUTTER and MAKER, to take charge of a shop; New York or vicinity; references. "Cornice Cutter No. 47," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

By an APPRENTICE of three years' experience at stove molding, with responsible firm; can give best of reference from former employer. Box 83, Greenfield, Ind. Apr. 7

TINSMITH; a thorough master of his trade also a practical hardwareman; thoroughly acquainted with the detail of stove and tin shop; have not had a day out of employment for years; satisfactory reasons for desiring a change of location; Eastern New York or New England replies solicited. "W. F. D.," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

A married man, American, 38 years old, with good business education and having a practical knowledge of TIN and GRAVEL ROOFING, HEATER and RANGE WORK, desires a permanent situation; is capable of attending to the books, making collections and representing his employer among business men; state services required and salary paid. "J. R.," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. Apr. 7

By a man experienced in the management of stove, range, heater and hot water and steam boiler foundries, as SUPERINTENDENT; can furnish first-class references as to ability. "N. K.," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

By a young man with seven years' experience at tinning, roofing, leaders, gutters and ranges; 24 years of age. Frank E. Marriott, Unionville, N. Y. Apr. 7

By a first-class PLUMBER and GAS FITTER; 15 years' experience at the trade in New York City; thorough mechanic; willing to go to any part of the United States. Wm. Mathews, 234 East 111th street, New York City. Mar. 31

As FOREMAN or JOBBER; 20 years' experience at roofing, plumbing, hot air, hot water and steam heating; best of references; strictly temperate. "G. R.," care Wm. Sofleiss, Woodbury, N. J. Mar. 31

An opportunity for tin, slate and tile roofers, architects, contractors, carpenters, builders and hardwaremen: a thoroughly practical ROOFER, has had considerable experience at trade in slate, tile, tin, iron and steel roofing; would be a valuable man for a good firm, earning 40 to 60 per cent. profit on every contract; can you do better? Can furnish best of references; will start on a trial of one month, work on a percentage or by the day; would be pleased to engage with a good firm; New York or vicinity preferred. "Tin, Slate and Tile Roofer," 17 South Front street, Hudson, N. Y. Mar. 31

By a CORNICE MAKER, who understands pattern cutting and drawing and tin and sheet iron work; some knowledge of plumbing; 35 years of age; temperate. G. Warren, Leeds, Mass. Mar. 31

By a TIN and SHEET IRON WORKER; 12 years' experience; understands all outside work, gutters, roofing, furnace, stove, range and fire place heater work and general jobbing; city. L. Saltman, 137 New street, Philadelphia, Pa. Mar. 31

By a STEAM FITTER, with an ice machine company or a good plumber, to learn the trade. "W.," P. O. Box 176, Middletown, Pa. Mar. 31

BOOKKEEPER and SALESMAN; young man, 21; practical and thorough accountant; experienced in the plumbing and tin business; capable to do estimating; best of references as to character and ability. S. Warren, Box 370, Newtonville, Mass. Mar. 31

By a TIN PLATE and SHEET IRON WORKER; fair knowledge of plumbing; position desired in a country shop near Boston; temperate; married. C. H. Chase, 22 Normand street, Salem, Mass. Mar. 31

With house manufacturing hardware specialties, by a man who has held position as FOREMAN for a number of years with one of the largest specialty houses in the country; experienced in hiring and management of help, in making toys, fruit presses, freezers, tin work, tinning and galvanizing cast iron, &c.; first-class references. "Hardware Specialties," office of *The Metal Worker*, 96-102 Reade street, New York City. Mar. 31

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One Glove Plant. One Mica Lamp Chimney Plant. Foot Power Press and Squaring Shears. Also stock of Tinware, Woodenware and Hardware, also Tinners' Tools, &c.

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Tin Plate manufacturers of first-class capacity wanted by a gentleman **against** English competition for the American trade. Address P. H. Petry & Co., 23 So. William St., N. Y.

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An enameler of 30 years' experience, about retiring, offers for sale his own and some of the best American and English receipts for enameling. All good and tested. Apply in first place to "GLASS," office of *The Metal Worker*, 96-102 Reade St., N. Y.

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Will buy a lot with iron tanks. Any size. Must be cheap for spot cash.
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1 lot of Shears and small Tinners' Tools.
All of the above are in first-class order and for sale cheap. Correspondence solicited. Address
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One No. 5 Sturtevant Fan and Counter Shaft, with 38 feet of 11½-inch Galvanized Iron Blow Pipe. Address
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An eligible outfit for the **Manufacture** of **Plumbers' Fine Brass** and **Nickel Plated Work**, Comprising all the **Machinery. Special Tools** and **Patterns** of the **W. F. Washburn Brass & Iron Works**, Yonkers, N. Y. Address

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One Stow's 31 inch Geared Power Squaring Shear. Will cut 3-16 in. iron, or lighter. Used very little. Call on or address
TINNERS' MACHINERY & SUPPLY CO.,
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There is a Market for Your Specialties in England.

Agencies for Novelties Wanted.
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ACCOUNTS GUARANTEED.

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A large commission to handle the diamond Extension Stove Back. Aluminum Model furnished. Sells nicely as a side line. Any part of the United States. One dozen weighs 100 pounds. Apply to
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An established Steam, Hot-water, Plumbing, Tin and Sheet Iron business, in connection with which is also carried a line of hardware, paints, oils and varnish. Business amounts to about $1500 per month and furnishes employment for two men besides myself. Further particulars can be obtained by addressing
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Hardware, House Furnishing Goods, Roofing and Stove business. Plenty of work.
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Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish at 3 to 6 cents per pound. Send for circulars.
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THE METAL WORKER

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FOR the accommodation of Stove Dealers who desire to undertake the summer storage of stoves for their customers, we have printed books of Receipts arranged on a new and ingenious plan. The Receipt to be given to the customer is on one side of the page, and on the other side is a Memorandum of the conditions, needed repairs and storage charges agreed to. *Opposite the Receipt* is its Duplicate, and *opposite the Memorandum page* is its Duplicate. When the leaf which has the Receipt on one side and the Memorandum on the other is torn out for the customer, it leaves Duplicate of Receipt and Memorandum on pages facing each other.

This arrangement has the advantage of bringing the two Receipt pages and the two Memorandum pages opposite each other, before the customer's Receipt is removed, facilitating copying and comparison, so that the Receipt and Memorandum given to the customer may *exactly correspond* with that retained by the person who receives the stove for storage.

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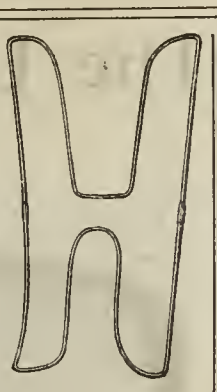
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Telephone Call. 330 Williamsburgh. ***North 11th and Driggs Sts., Brooklyn, N. Y.***



Before. After.

Covert Pants Stretcher.



THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

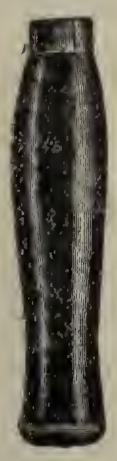
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

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No. 7½, size ¾ 2¾.

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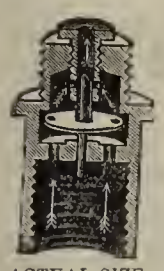
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SHOULD BE USED ON EVERY

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as they hold the heat back, retaining it just where it is wanted, with no smoke or gas in the room, saving 25 per cent in fuel.

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References Furnished on Application.

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ESTABLISHED 1853.

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Solicitors of Patents.

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— TRICKS OF TRAVELING MEN.—A short while ago I got on the night train at Hempstead, on my way to Dallas, and purchased a ticket for a lower berth in the sleeper. I was reading a paper when, happening to look over to my right, I saw a frail, delicate looking woman whose hacking cough made me think her in the last stages of consumption, and I at once felt a warm sympathy and pity for her. A few minutes later the porter came to me and asked me if I would exchange my lower berth for an upper one to accommodate the poor woman, who, getting on the train also at Hempstead, was too late to secure a lower berth.

I assented cheerfully, and soon afterward climbed up into my roost and went to sleep. Just before reaching Dallas next morning I got up and hurriedly dressed, and as I was on my way back from the dressing-room, what was my surprise to see a big, stout fellow getting out of the lower berth which I had given up. I was angry at first, but on thinking it over I concluded he was her husband, whom I had not noticed the night before, and who wished to be near her so as to hear her calls during the night, but very soon I saw her come out of another lower berth further down the car. I noticed he did not go near to her or speak to her, and when we reached Dallas was on the lookout and saw that he and she took different vehicles.

I at once suspected something and called to the porter. He tried to dodge me, but it was not to be done, and grabbing him by the collar I shook him until his ivories rattled and demanded an instant explanation.

The now frightened negro said :

"Well, boss, I'll tell you the truth. The big gemman, who got on at Haler, could only get an upper berth, and he gave me a quarter to tell you that the poor woman had no lower one, and I done as he axed me."

I was surprised and asked him if he had ever done this trick before.

"Oh, yes, boss. Dere's several old traveling men who works dis trick."

Was I hot? Oh, no.—*St. Louis Globe-Democrat.*

He Insisted.

He was a tall, slim man, says the Detroit *Free Press*, carrying a satchel in his right hand and an umbrella in his left. As he started to cross Jefferson avenue, near the Third street depot, a beer wagon which he did not see might have run him down had not a fellow pedestrian called out an alarm and pulled him back to the curbstone.

"Sir, you doubtless saved me from serious injury, and perhaps from death itself," observed the man, as he realized the situation.

"Yes, sir."

"And you should be rewarded."

"I don't want anything, sir," modestly replied the rescuer.

"But I insist. Such actions as yours demand liberal recognition. I am from Nebraska. I have just platted a town there. I am asking $150 each for lots on the main street, but in your case you can take your pick for an even $100, and as taxes are now due you'd better scrape around and get me $6.50 to pay on your lot."

— A LESSON IN FINANCE.—A well-known Chicago merchant has a customer in Columbus, Ohio. A bill became due and he sent a statement, but, as is the custom in these later days, received no remittance.

Then he notified his customer that he would draw on him for the amount of the bill, $700 or so. This he did.

The bank received the draft and presented it to the customer.

The customer had $300, and wanted to borrow $400 from the bank to make up the amount of the draft.

The bank had no money.

The customer could not pay the draft and so it was returned.

A few days afterward the customer got hold of a few dollars, which he deposited, and then sent check on Columbus bank aforesaid to dealer in Chicago.

Dealer takes Columbus check to Chicago bank.

Chicago bank refuses to credit dealer's account at face, but will at 2 per cent. discount.

Dealer thinks he cannot afford to pay $14 for collecting $700, so takes check to express company. Express company forwards check for collection to Columbus.

Columbus bank pays check with New York draft, which express company delivers to Chicago dealer.

Dealer takes draft to bank.

Bank will credit only on 3 per cent. discount.

Dealer goes back to express company.

Express company forwards draft.

Presents draft drawn on in New York.

Bank indorses check: "Good; payable through New York clearing house."

Express company returns draft to Chicago dealer.

Air blue.

Linguistic pyrotechnics.

Dealer again takes draft to express company.

Orders express company to collect cash or protest draft.

Express company forwards draft to New York.

Again presents, and informs bank of instructions.

Bank pays $700.

Express company returns cash to Chicago dealer.

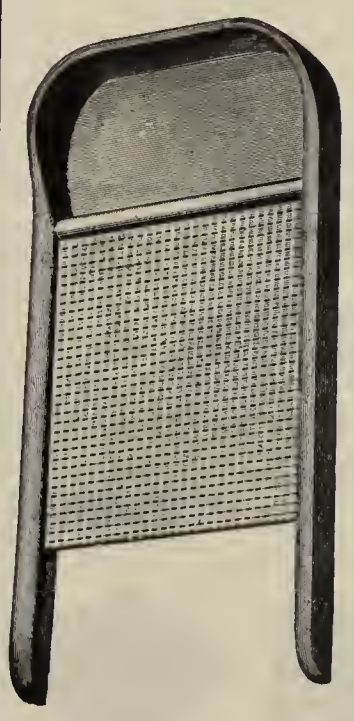
All happy.

Time, four weeks and two days. —*Timberman.*

—"WAITER, it is almost half an hour since I ordered that turtle soup."

Waiter: "Sorry, sir, but you know how slow turtles are."—*Fliegende Blatter.*

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Is a Zinc Board made from best quality No. 6 Zinc, the heaviest and strongest Zinc in use for Washboards.

CRIMP—The Crimp is our Improved Deep Globe acknowledged far superior to any now in use on other boards.

OFFERS—absolute protection from water at sides as well as the top of the soap board.

WHY?—Because being made of one piece which is bent thin and broad at the sides and top of soap board where all splashing occurs, it is impossible in washing to splash over it.

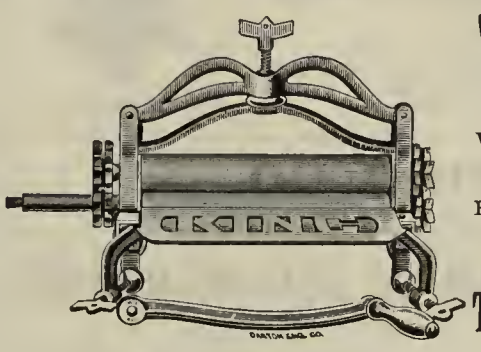
CONSTRUCTION—The Board in point of construction excels anything of its kind ever produced. Its lines present a symmetry and regularity pleasing to the eye, and in point of strength is unquestionably superior to any.

SALES—Where these are offered for sale competing boards are not "in it."

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This TEA KETTLE is made of "PURE METAL," all in one piece. No SPOUT to melt off. No SEAMS to open. No chance for LEAKAGE. Will not RUST or CORRODE. No plating to wear off. STIFF, FIRM and INDESTRUCTIBLE. Altogether the NEATEST, PRETTIEST, BEST, LIGHTEST one piece and most durable TEA KETTLE ever offered.

DON'T FAIL TO SEND FOR SAMPLES.

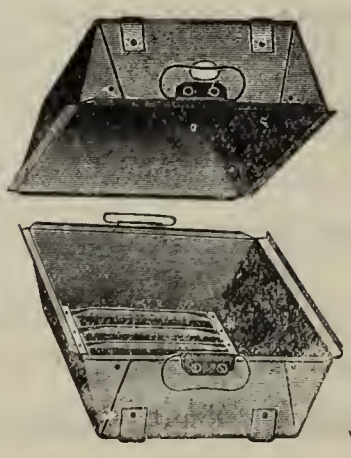
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The New Improved "American" Waffle Iron, { With Special Features for Gas and Gasoline Stoves.

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ROASTER and BAKER.

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Cooks Quicker than any other Porcelain Rice Boiler made.

"NEVER-BREAK"

Wrought Steel Spiders, Griddles, Kettles, Stew Pans, Maslins, Scotch Bowls, Etc.



Flat Bottom Kettles, Four Sizes. Polished, Tinned AND Porcelained.

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ROASTING AND BAKING PAN.
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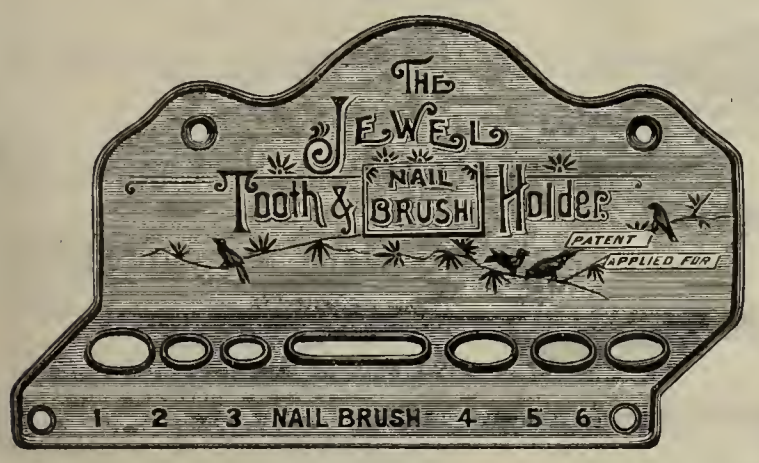
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TOOTH AND NAIL BRUSH HOLDER.

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THIS new and novel article fills a long-felt want for an attractive, durable and useful Tooth and Nail Brush Holder. It will hold any size brush, and, as each opening is numbered, the brushes are kept separate and there is no possibility of getting the wrong one. The ornamentation is lithographed on the surface, and it will not peel or wear off.

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The aroma is saved.
The only practical mode of making delicious soups.
☞ It has often been remarked that the French cooks can make excellent soup out of what others throw away. The secret is they use proper appliances. ☜

Sizes, 4, 6, 7, 8 and 10 Qt., 3, 3½, 4, 5 and 6 Gal.

WRITE FOR PRICES.

THE STUART & PETERSON CO.,

Burlington, N. J., U. S. A.

— HANK BITTERS (a prominent citizen of Oklahoma): "Goin' to the ball tonight, Ike?"

Alkali Ike: "I'd like to, mighty well, Hank, but I can't. You see, it's to be strictly a full dress affair, and I've lost one of my spurs."—*Puck.*

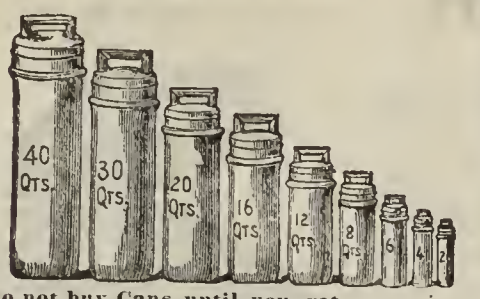
IT'S quite a job to set up stoves
And join the pipe together;
But what most harrows up one's soul
Is how to get enough of coal
To last him through cold weather.
—*Kansas City Journal.*

— NOMENCLATURE.—"They call the land 'tery firmy,'" groaned Barnes on his first voyage. "I wonder what they call the sea?"

"Vicy versy, I guess," said Mrs. B., as she wobbled about.—*Truth.*

CLAD'S

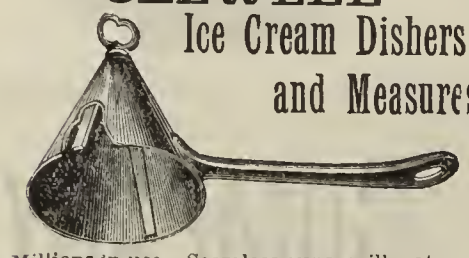
Iron Enameled Ice Cream Cans.



Do not buy Cans until you get our prices. We are Headquarters.

CLEWELL

Ice Cream Dishers and Measures.



Millions in use. Seamless cups, will not rust. German Silver knives; and not tin knives. Cream will not stick to sides. Sizes standard.



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V. CLAD & SONS,

MANUFACTURERS,
117-119 So. Eleventh St., Philadelphia.

WAYNE'S Celebrated Cork-Filled, Self-Ventilating, American REFRIGERATORS

GUARANTEED TO BE
THE BEST IN THE WORLD!
OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,
At LOWEST PRICES EVER KNOWN.
If your dealer does not have them, Send for Illustrated Circular and Price-List, to

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MANUFACTURER,
124 MAIN STREET, CINCINNATI, O.

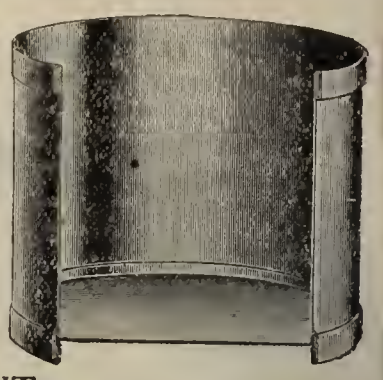
— BINGO: "Did you succeed in cutting down on your shopping expenses this month, as I requested?"

Mrs. Bingo: "Oh yes, indeed, dear. You know that nice woolen underwear you wanted? Well, I got something in cotton much cheaper."—*Exchange.*

— THE BOOK THAT HELPED HIM: "Would you oblige me," said the reporter who gets novel interviews, by telling me what book has helped you most in life?"

And after a thoughtful pause the great man answered, "My bank book."—*Washington Star.*





McKIM'S PATENT

WROUGHT STEEL GRAIN MEASURES.

STANDARD.

Capacity, ¼ peck, ½ peck, 1 peck, 2 pecks.

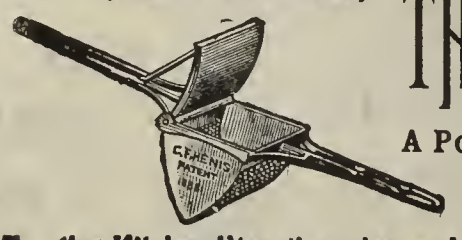
Nested or packed in single sizes

This measure is without doubt the best article of the kind on the market. The bottom is fastened mechanically in the slot formed by the peculiar method of folding the bottom, which is clearly shown in the cut above. It is further strengthened by the band folded at the top.

It is made completely of solid steel and is warranted to outlast any other measure. Manufactured only by

The Bellaire Stamping Co., Harvey, Ill.

(OPEN FOR FILLING.)



No other Kitchen Utensil can be used for so many purposes.



(HOW IT OPERATES.)

THE HENIS Fruit Press and Vegetable Strainer.

A Potato Masher, A Fruit Press, A Jelly Press, A Disintegrater, A Colander, and A Vegetable Strainer,

COMBINED IN ONE

Small, Strong, Light, Cheap, Handy Utensil.

ALWAYS READY. EASILY CLEANED.

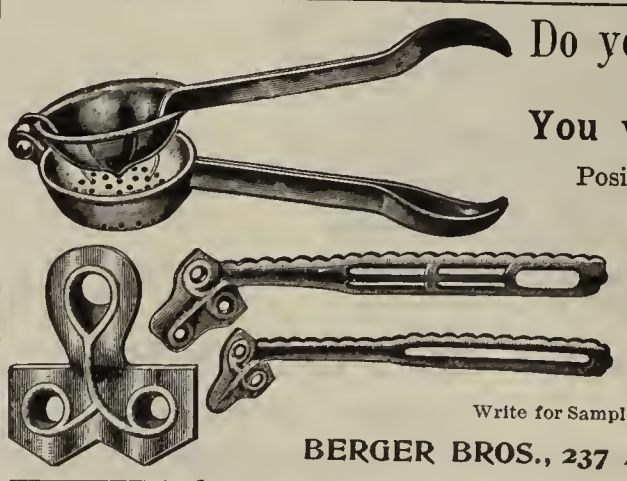
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YOUR DEALER HAS IT.

—MANUFACTURED BY—

WILLIAM VOGEL & BROS.

BROOKLYN, N. Y.



Do you make Lemonade?

IF SO,

You want our SQUEEZER.

Positively the best. Suitable for any size lemon.

We also make the finest

Sauce Pan Handles

in the country. Beautiful designs; all sizes; large stock.

Write for Samples, Catalogue and Prices.

BERGER BROS., 237 Arch St., Philadelphia, Pa.

The sample tells the story!

A sample of Dixon's Pure Flake Lubricating Graphite is sent free of charge with an interesting and instructive pamphlet. Every wide-awake engineer and mechanic should send for them.

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SOLE MANUFACTURERS OF GRANITE IRON WARE

St. Louis Stamping Co.,

ST. LOUIS, MO.

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Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.



ROME Seamless Copper Tea Kettles,

RANGE KETTLES and NICKEL PLATED COPPER TEA and COFFEE POTS.



THE ROME Tea Kettles are full size and weight of metal. Have seamed in spouts that cannot be melted off. Handles of one piece of wire running through the wood. These goods are the best and cheapest on the market.

ROME MANUFACTURING CO. 135 AND 137 SOUTH JAMES ST., **ROME, N. Y.**

HUNTER'S SIFTERS

Are now Made Better than Ever at

HAMILTON, O.

BY THE
FRED. J. MEYERS MANUFG. CO.

F. J. MATTISON,
Eastern Ag't,
New York.



No. 102.
View showing position of Removable Galvanized Ice Compartment, Mineral Wool Packing, &c.

THE

Gurney Patent Refrigerator

Is the best seller on the market,

BECAUSE

It has ***special features, talking points, selling points*** not found in any other Refrigerator.

VIZ.: It is the only Refrigerator that can be kept absolutely pure and clean forever. Under the **Gurney system** the **lowest average temperature** is reached with the **greatest economy of ice** as proven by actual test.

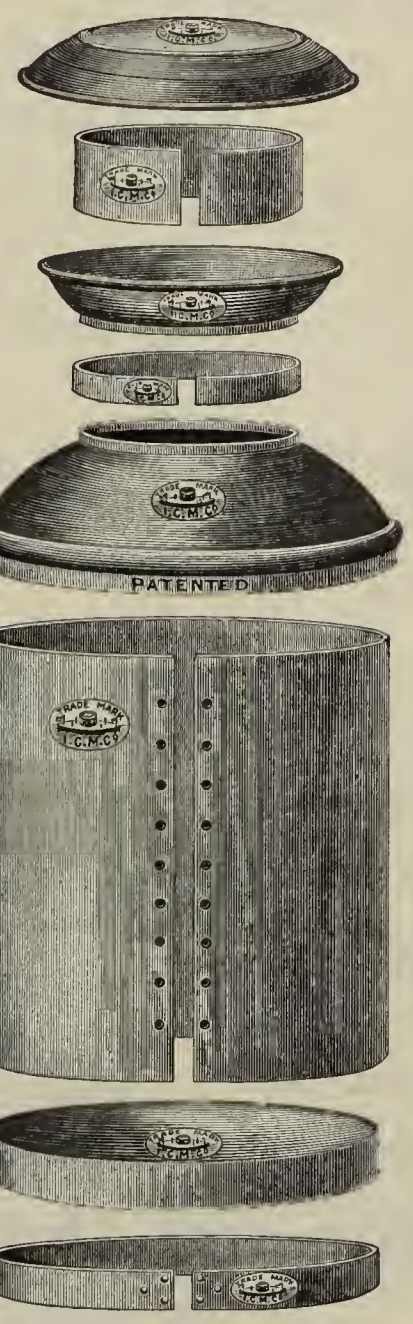
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GURNEY REFRIGERATOR CO.,

FOND DU LAC, WIS.

CAUTION!

Every genuine IRON CLAD MILK CAN has our registered trade-mark stamped on each and every part of the stock from which the cans are made up. All others are either imitations or **INFRINGEMENTS.**



Improved Breast, with Inside Hoop.

PATENTED.

FURNISHED WITH

New York, Philadelphia, Baltimore, Cincinnati, Pittsburgh, St. Louis, Detroit, Chicago, Elgin, Dundee and Dubuque patterns.

Perfect Satisfaction and Good Value Guaranteed.

Iron Clad Mfg. Co.,

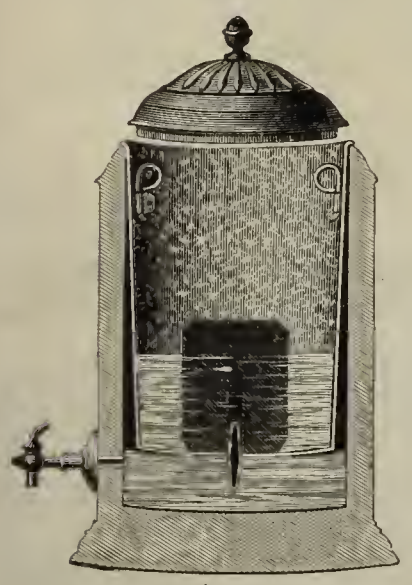
22 and 24 Cliff Street, New York City, N. Y.

The "CENTRAL" Filter=Cooler.

——WITHIN REACH OF EVERY FAMILY.——

CLARIFIES AND PURIFIES THOROUGHLY—NO TASTE OR SMELL—ONLY PURE CARBONS USED—REMOVABLE FOR CLEANING.

The "CENTRAL" Filter=Cooler is an adaptation of a device long in use abroad, especially in France, Germany and England. Heretofore applied only to expensive constructions, it is now brought within reach of every household. The cooler, complete, costs but little more than the ordinary article, while the filtering device is of the very highest quality. The carbons are pure and easily detached for cleaning; the filtering cylinders are made to fit **all our regular series of Coolers.** An important feature of the Filter-Cooler is the **separation** of the **ice** from the **filtered water.**



Sectional View of Cooler Showing Filter in Position.

Prices and Sizes—Cooler-Filters Complete.

GALLONS—	2	3	4	6	8	10	14
Japanned or Crystal, each,	$4.50	5.00	5.75	7.00	8.50	10.50	14.50
Extra Heavy—Japanned, with side handles, each,	$6.00	6.50	7.50	8.75	9.75	12.00	16.50

Filter Cylinders Only, Fitted with Carbons.

GALLONS—	2	3	4	6	8	10	14
Each,	$2.50	2.75	3.00	3.50	4.00	4.50	5.50



Showing Filter Detached.

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23 and 25 CLIFF STREET, - - NEW YORK.

GEUDER & PAESCHKE MANUFACTURING CO.,

MANUFACTURERS OF

TINWARE AND SHEET METAL GOODS,

MILWAUKEE.

GALVANIZED SHEET STEEL WARE.

Dippers,
Wash Boilers,
Tea Kettles,
Oil Cans,
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Watering Pots,
Wash Bowls,
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THE TRIUMPH COOKER,

WITH LOCK COVER.



STEAMLESS, ODORLESS AND NON-BOIL-OVER.

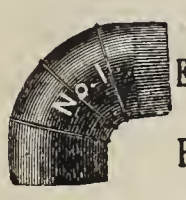
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.

A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.

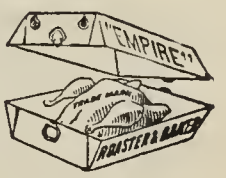
THE HARTFORD HOLLOW WARE COMPANY,
HARTFORD, CONN.

NEW YORK ELBOW CO.,

18 Cliff St., N. Y. City.



Makers of Elbows AND Roasters.



NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. / Chicago, Ill.

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 in.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
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MINERAL FACINGS.
PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

DIAMOND EXTENSION FIRE BACK.

Patented July 11th, 1893.

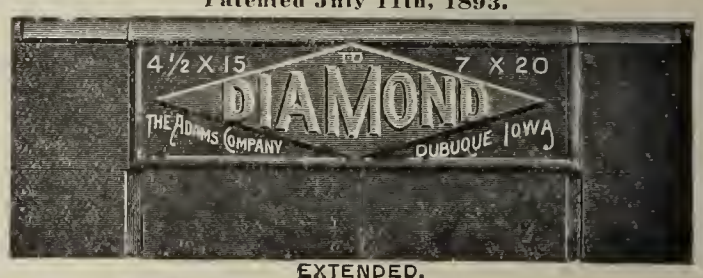


CLOSED

NO BOLTS.

SLIDES IN DOVETAILS.

Patented July 11th, 1893.



EXTENDED.

One Size Adjusts in Width from 4 1-2 to 7 inches.
In Length from 15 to 20 inches.

For Sale by all Jobbers of Stoves and Hardware. Manufactured by

THE ADAMS COMPANY, - - DUBUQUE, IOWA.



THE WHITING CUPOLA

Is especially adapted for Stove Foundry use.

CRANES,
LADLES,
TUMBLERS, &c.

Detroit Foundry Equipment Co.,

Detroit, Mich. Ave. & D. & B. C. R. R.
Chicago, 225 Dearborn St.
New York, 182 Front St.

MARCY STOVE REPAIR CO.

MANUFACTURERS OF

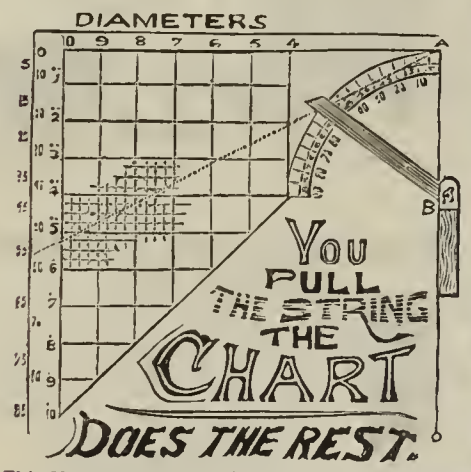
Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

74 Beekman Street, New York.

Foundry, 157 to 167 Imlay St., Brooklyn.



This Chart gives more information about elbow patterns than a mammoth book could hold. A pattern made in five minutes for **any Elbow.** 50 cents by mail. Address

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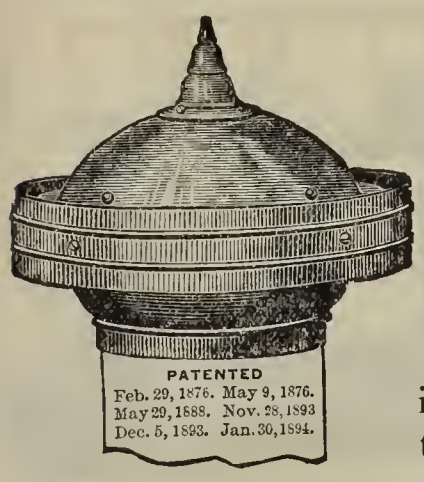
— MR. ULL and MR. MART, standing in a store, noticed a wagon containing a large barrel passing along the street.

Ull: "I wonder what is in that barrel?"

Mart: "Don't you know?"

Ull: "No!"

Mart: "Two heads."



There's Always Room at the Top
—FOR A—
GLOBE VENTILATOR.

Cast your eyes over the house roofs, and there you see them standing like silent sentinels, to guard the lives and preserve the health of those within.

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Our repairs are sure to fit, as they are all made from manufacturers' original patterns

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STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

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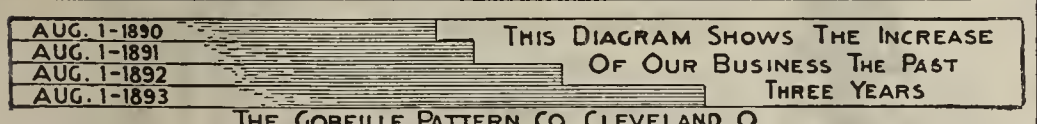
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RUTLAND LINING
FITS ANY STOVE
AND IS **CHEAP.**

RUTLAND FIRE CLAY CO., - RUTLAND, VERMONT.

DON'T FORGET
TARBOX
For your Stoves. All Dealers.

"FIRESTONE."
A new material which makes the strongest, most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

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PATTERNS

Modern and Ornamental Drawings for Stoves, Ranges and Furnaces made to order.

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TROY, N. Y.
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By Day or Contract. Duplicates or Exclusive Designs.
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Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

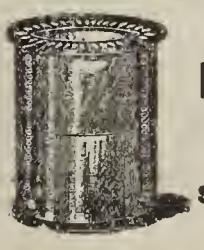
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ARTISTIC STOVE PATTERN WORKS
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FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE
Stove Pattern Works.

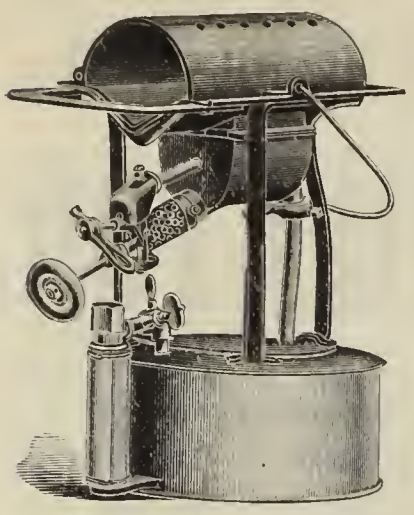
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Established 1866.
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STOVE PATTERNS
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PERFECT PATTERNS
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Makes Patterns for Stoves to cook or to heat.
For Furnaces, Ranges, cast or sheet,
To burn coal oil, gasoline, straw or peat.
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BONANZA NO. 1.

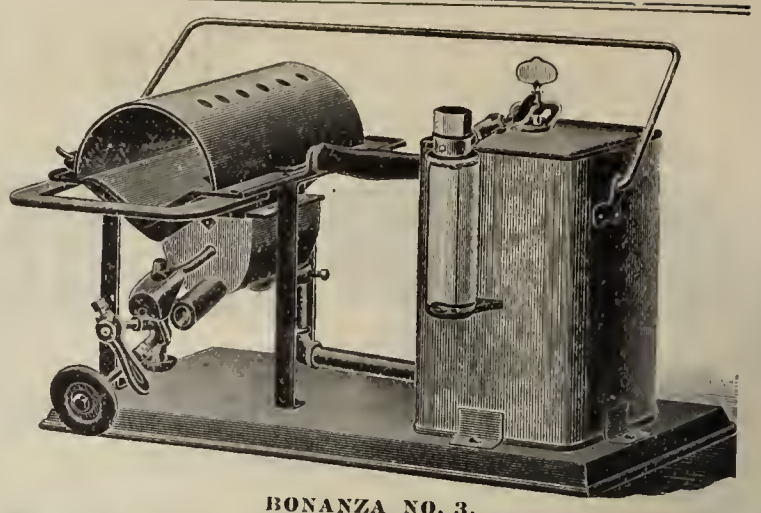
No. 1

BONANZA FURNACE

For tinners only.

PRICE $6.

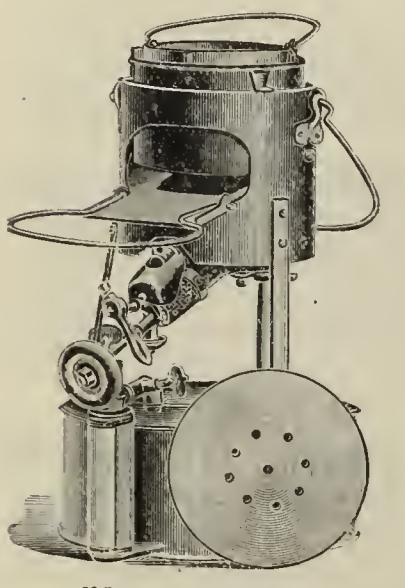
Hinged arch top. Galvanized steel with brass top tank. Best furnace for roofs or cornice work. Will heat the largest coppers. Cannot blow out. Rubber pump handle.



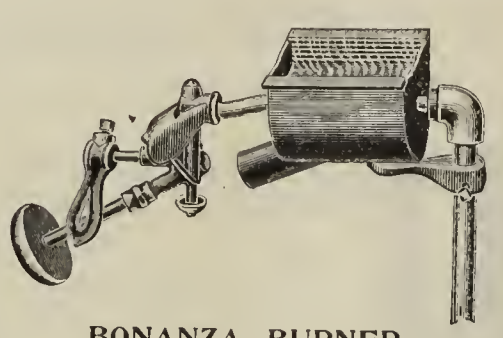
BONANZA NO. 3.

No. 2 BONANZA

Is for plumbers and tinners. Price $6.50, including lead pot and casing for plumber. Alone, price $6. Tank and burner same as No. 1. Bonanza No. 3 same as No. 1 except the arrangement of parts.



NO. 2 BONANZA.
For Plumbers and Tinners.



BONANZA BURNER.

Burns from both sides. Heat terrific; heats 5-pound coppers red in 3 minutes; heats 10-pound coppers in 5 minutes; melts 10 pounds lead in 5 minutes. Hottest fire ever produced from gasoline.

Write for New Catalogue and Poetry.

Special Low Prices for Cash with the Order.

M. L. HULL,

CLEVELAND, OHIO.



NO. 4—1893 PLUMBERS' FURNACE.

USE VANDERMAN'S SPECIAL TOOLS.

No Plumber or Steam-Fitter can Afford to be Without Them.

THE VANDERMAN PIPE VISES CANNOT BE EQUALED.

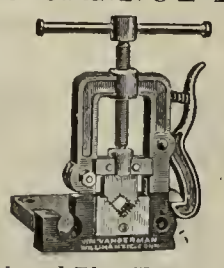


Lead Pipe Cutter.

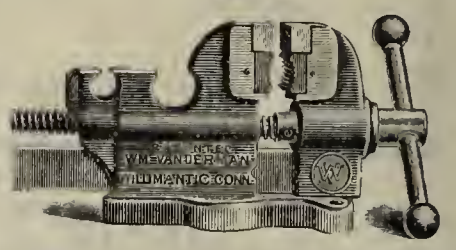


Joint Runner (applied).

Lead Pipe Bender.



Hinged Pipe Vise.



Comb. Bench Vise with Bending Forms.

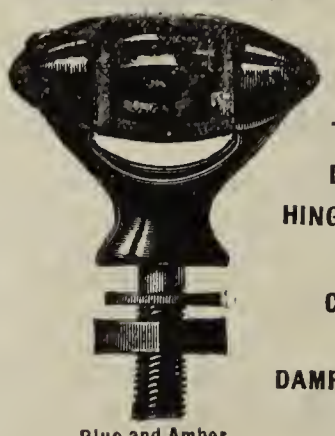
USE VANDERMAN'S ESTIMATE AND LIST-BOOK. It prevents mistakes in making estimates.

OFFICE ESTIMATE BOOK, $1.50 each. POCKET ESTIMATE BOOK $0.40 each. Sent by Mail prepaid if cash is sent with order.

The Vanderman Plumbing & Heating Co., Willimantic, Conn.

— "When I was a youth of 18," said Representative Kilgore of Texas, "I was set to work by my father plowing a 20-acre lot with a bull tongued plow and a pair of green steers. The ground was rough, and had more sticks and stones beneath the surface than it had growth above. The steers had their own notion on the subject of work and I had mine. They were generally opposed to executive sessions and administrative interference, and I had a duty to perform. The result of our joint sessions was a very much plowed field, a well broken but reduced pair of steers, a broken bull tongue and a fine farmer spoiled. I immediately informed the old gentleman that I was no longer a candidate for bucolic honors, and that I would not serve if elected. He tried to force the nomination upon me, but when he saw the bull tongue, the steers and the field he thanked me with tears in his eyes and suggested that I study law." —*Washington Post.*

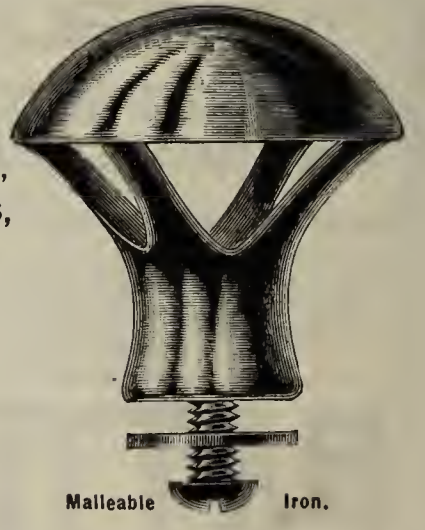
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Blue and Amber.

Manufacturer of
MALLEABLE IRON
TURN-KEYS, SHAKERS,
DAMPER SLIDE KNOBS,
HINGE PINS, POKERS,
LIFTERS,
CROWN DAMPER,
—AND—
DAMPER ATTACHMENTS.

"THE CROWN."

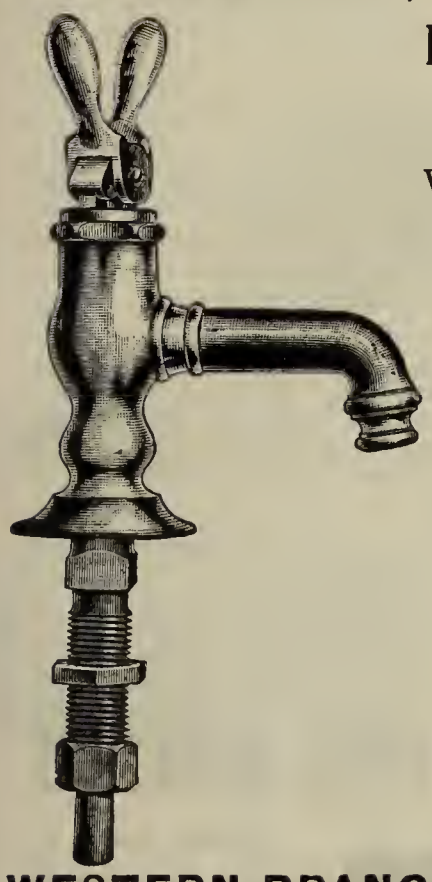


Malleable Iron.

W. F. GREENE, Troy, N. Y.

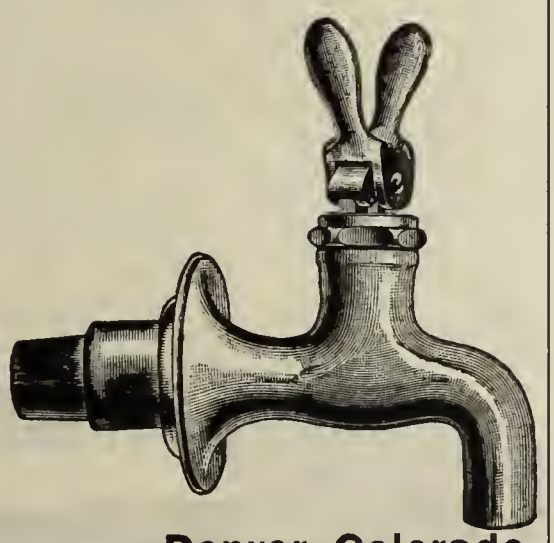
L. WOLFF MFG. CO.,

GENERAL OFFICES, 93 West Lake Street, Chicago.

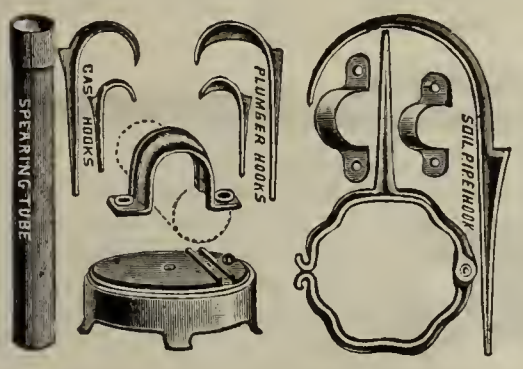


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To be worked out of doors or on roofs in all kinds of weather. If not satisfactory, bring them back and we will refund your money.

All have a cast iron cylindrical burner, so arranged that solder cannot clog them.

Ask your Jobbers for them, or write for Prices.

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OUR BANGOR UNION, ALBION & MAMMOTH VEIN QUARRIES
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HAND SHAVED BANGOR SLATE BLACK BOARDS

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PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

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Automatic Groover, with Quick Return Movement. Conceded by competent mechanics to be the best. Operated rapidly from outer end without changing position. Clamp opens and carriage stops automatically at end of travel. Finishes seam at one operation. Does light or heavy work. Send for circular.

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Proprietor: "We do, sir."

"I should think it would be mighty bad for your health."

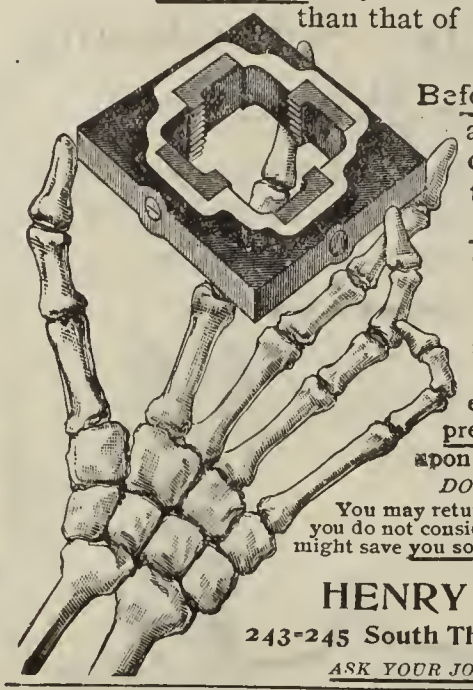
"My friend, we are not in this business for our health."—*Chicago Daily Tribune.*

Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

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The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



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Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

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DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

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243-245 South Third St., Philadelphia, U. S. A.

ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.



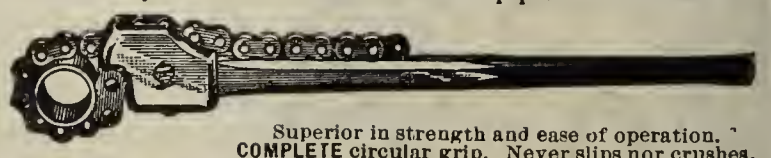
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Forged Steel.

All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

TRIMO CHAIN PIPE WRENCH.



Superior in strength and ease of operation. COMPLETE circular grip. Never slips nor crushes.



Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.

TRIMO BASIN WRENCH.

TRIMONT MFG. CO., ROXBURY MASS.

The "Boyd" Basin.



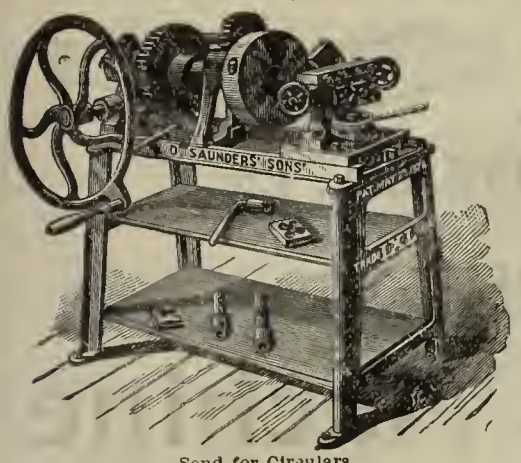
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Beware of imitations. None genuine without our Trade-Mark and Name.

STEAM AND GAS FITTERS, HAND TOOLS.

Also, Patent Wheel Pipe Cutters.

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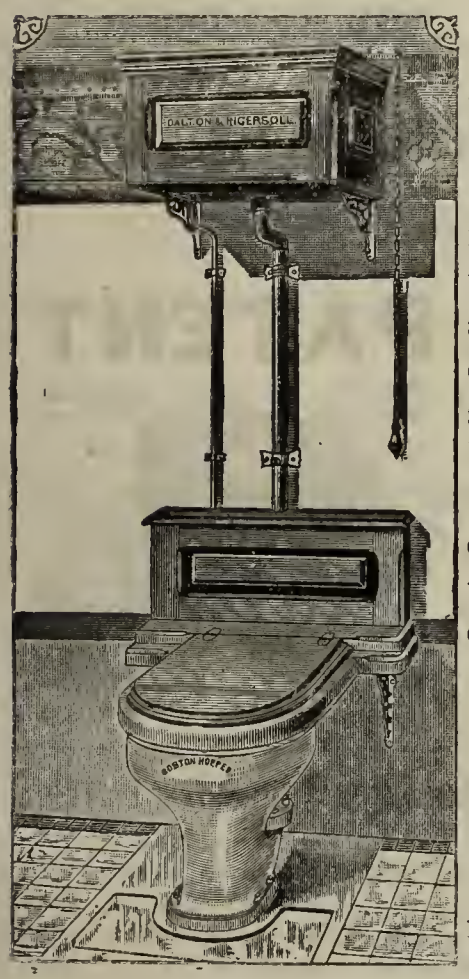
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Considered the perfection of closets. It is a modification of what is known to the trade as a Short Hopper and Trap combined. Its exterior outline is in pedestal form, which gives perfect support to the bowl. This construction will allow the seat to rest directly on the closet, dispensing with the use of seat legs, if so desired, allowing a better opportunity for cleaning around the closet. This feature of construction will recommend itself to those looking for simplicity and cleanliness.

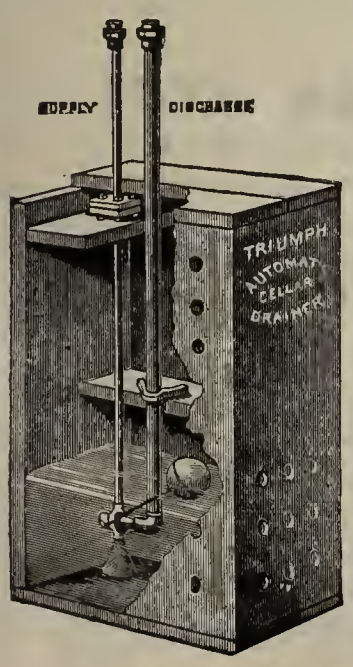
[See our advertisement next week for sectional view.]

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The Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

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Pat. May 19, '85. Pat. May 26, '85. Pat. July 14, '85. Pat. Aug. 8, '86. Pat. Nov. 23, '86.



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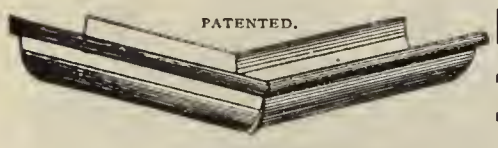
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FOR FINDING LEAKS IN

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For Family Oil Cans, Etc.

(Patent applied for.)



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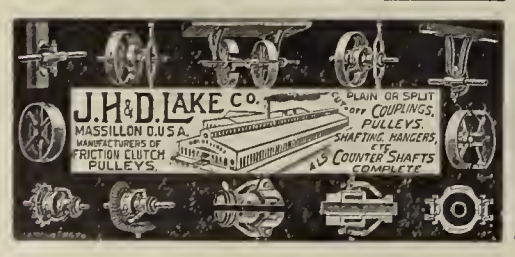
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Wrough Iron Pipe of all sizes cut to order



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SHOWING SAFETY SPRING.

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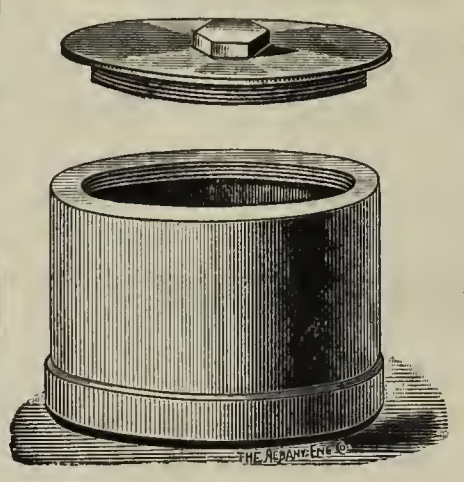
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For turning the water into or off the cistern.

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A Common Sense Trap Screw Ferrule.

The body is of cast iron in regular pipe sizes, fitting the Hub neatly and making a good wall to calk against. The **COVER** being of **BRASS** cannot unite with the iron and corrosion is prevented by the use of Graphite. A Common Sense Article at half the cost of brass.

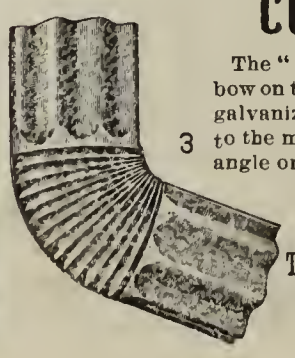
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The Reversible Ratchet Drill.

CURTIS & CURTIS,

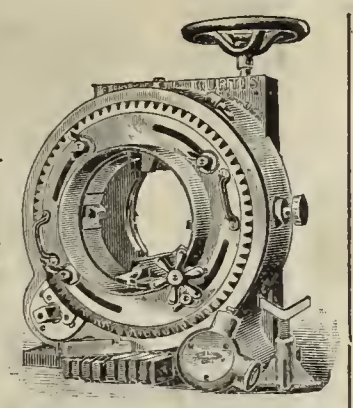
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TOOLS or MACHINERY

Used in Working Wrought Iron Pipe.

Send for new 52-page Illustrated Catalogue.



The Forbes Patent Die Stock.

The Climax Ratchet Stock



Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

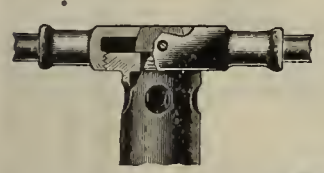
No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, $10.00
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For sale by leading jobbers.

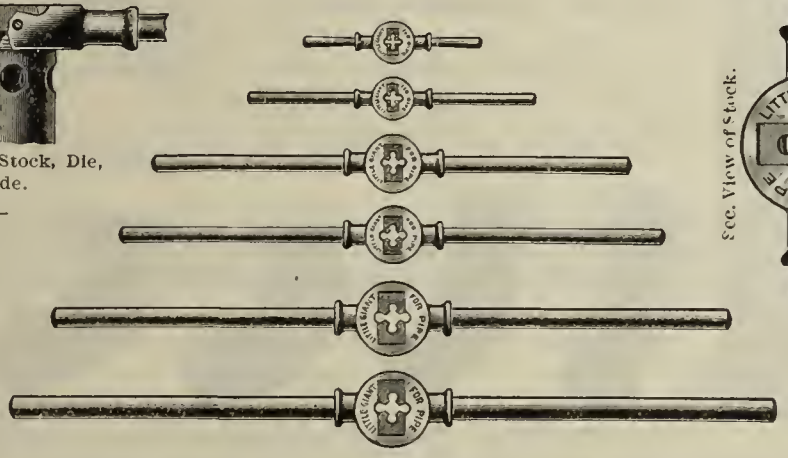
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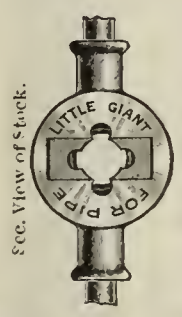
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PIPE PLATES WITH STOCK, DIE AND GUIDE FOR EACH SIZE.



Sec. view of Stock, Die, and Guide.





Sec. View of Stock.

The Latest Thing Out.

Send for Prices.

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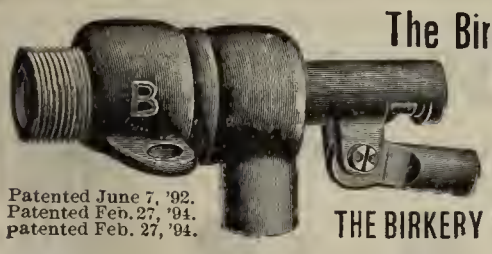
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It will not Sing or Hammer.

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With Nickel Trimmings are the Neatest and Best.

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FOR CISTERNS.

It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

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Ask your jobber for them

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Successors to
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8-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.



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Best Eave Trough Fastener in the World.

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LINENOID

IS NOT A

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Little Girl: "Yes'm; he's got so now we can tell whether he is playing or tuning."— *Good News.*

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Expanding Conductor.

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Stamped Corrugated Elbows & Shoes.



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In these goods the trade find for the first time satisfactory expanding Elbows and Shoes perfect in curve and free from unreliable and unsightly soldered joints.

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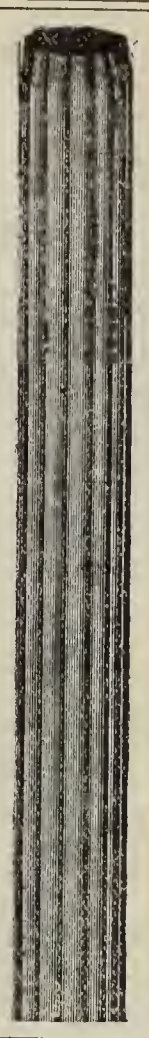
LAMB & RITCHIE,

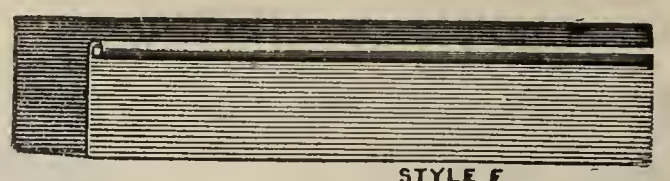
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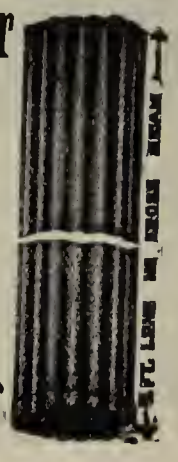
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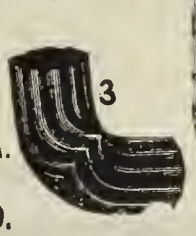
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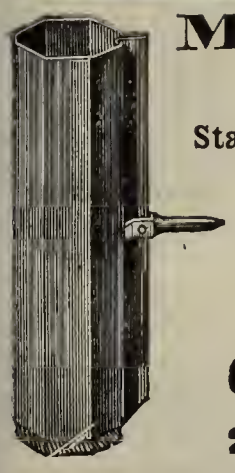
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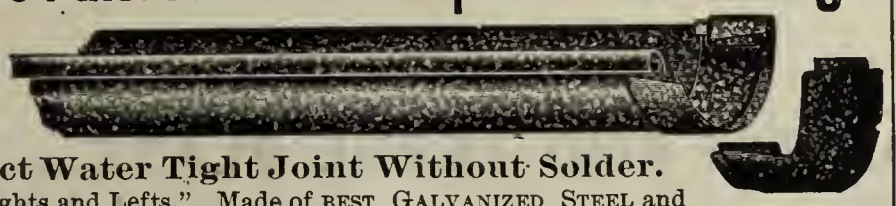
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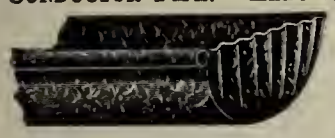
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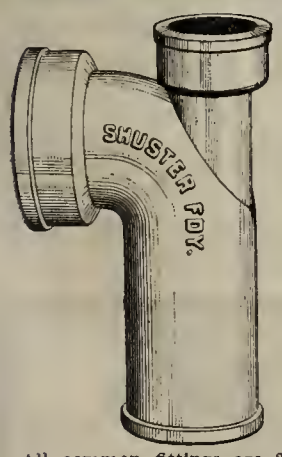
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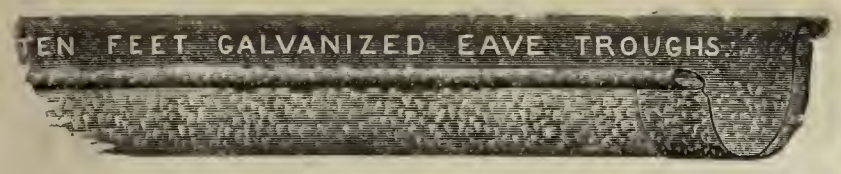
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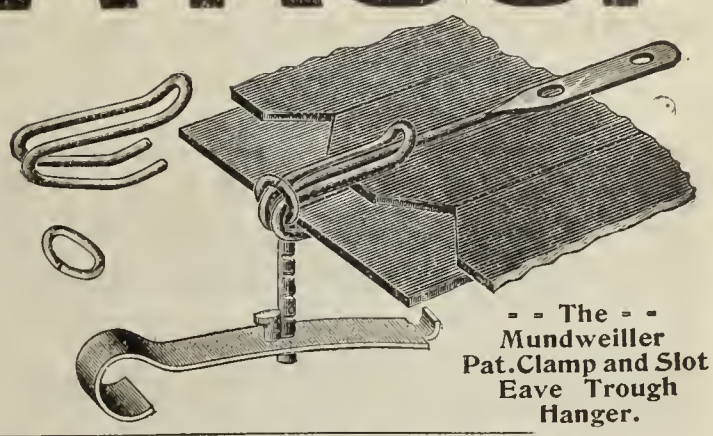
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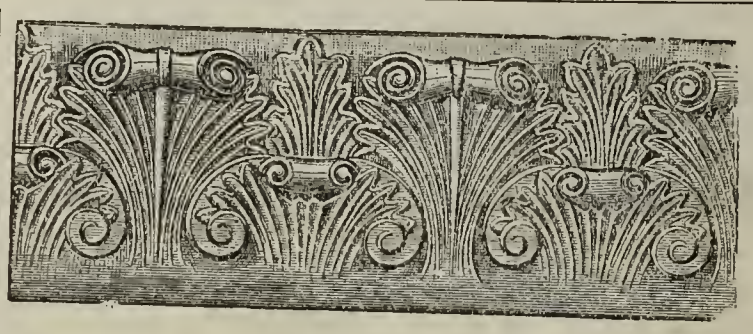
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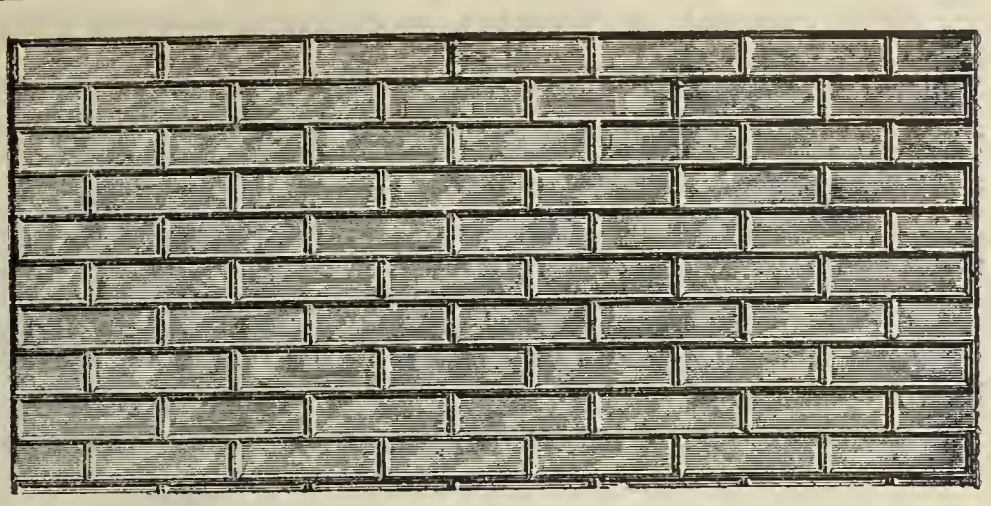
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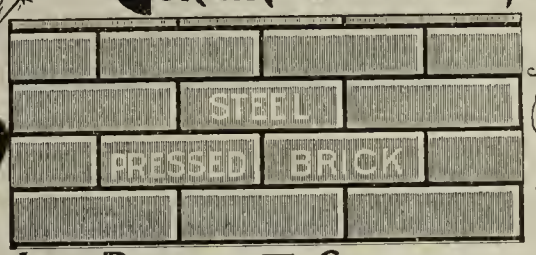
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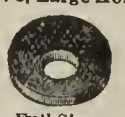
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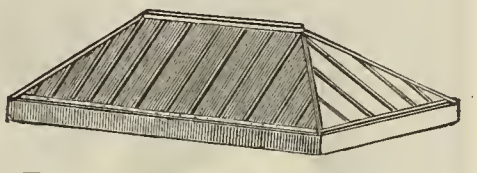
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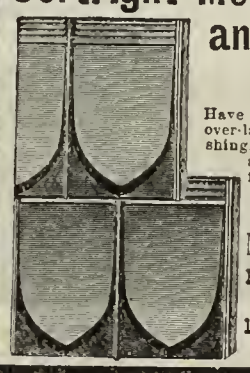
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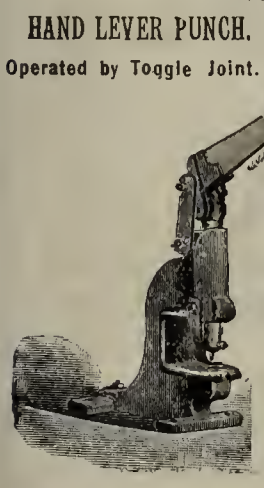
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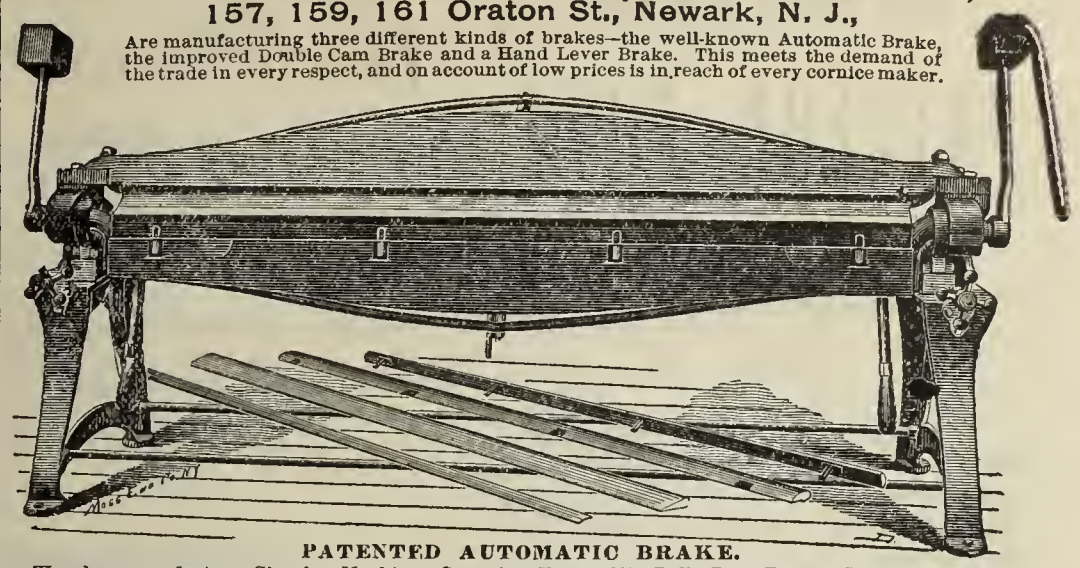
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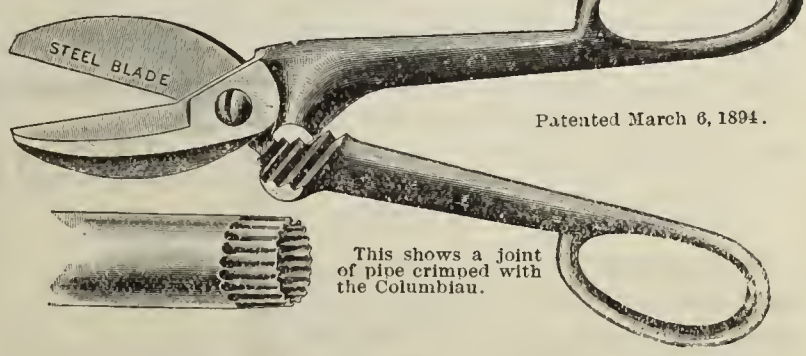
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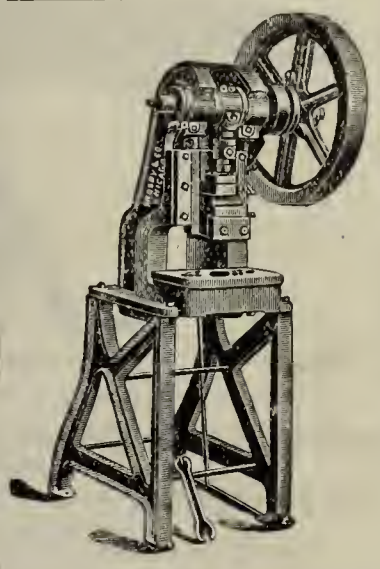


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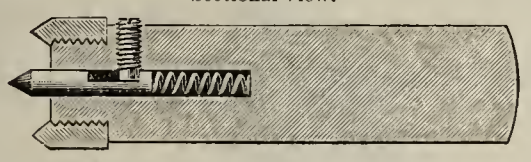
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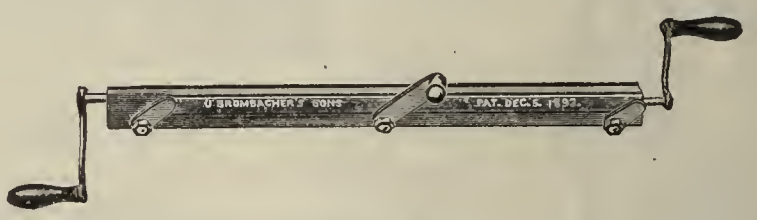
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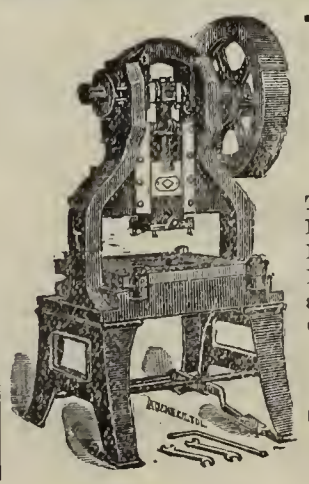
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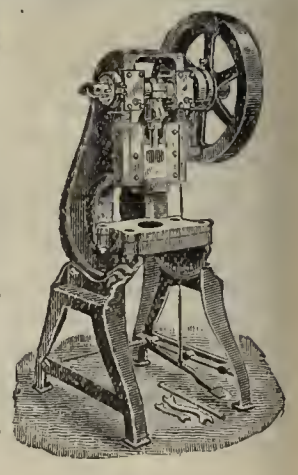
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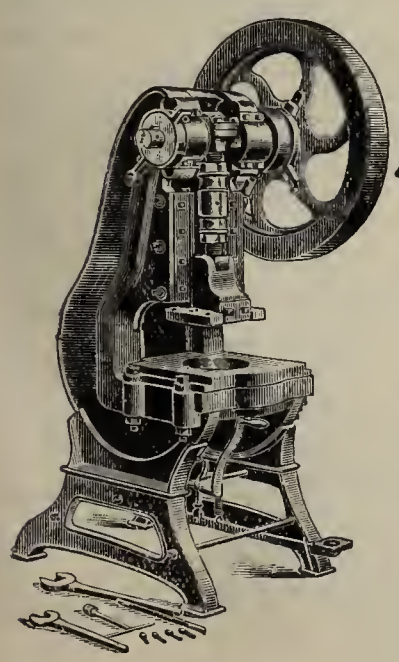
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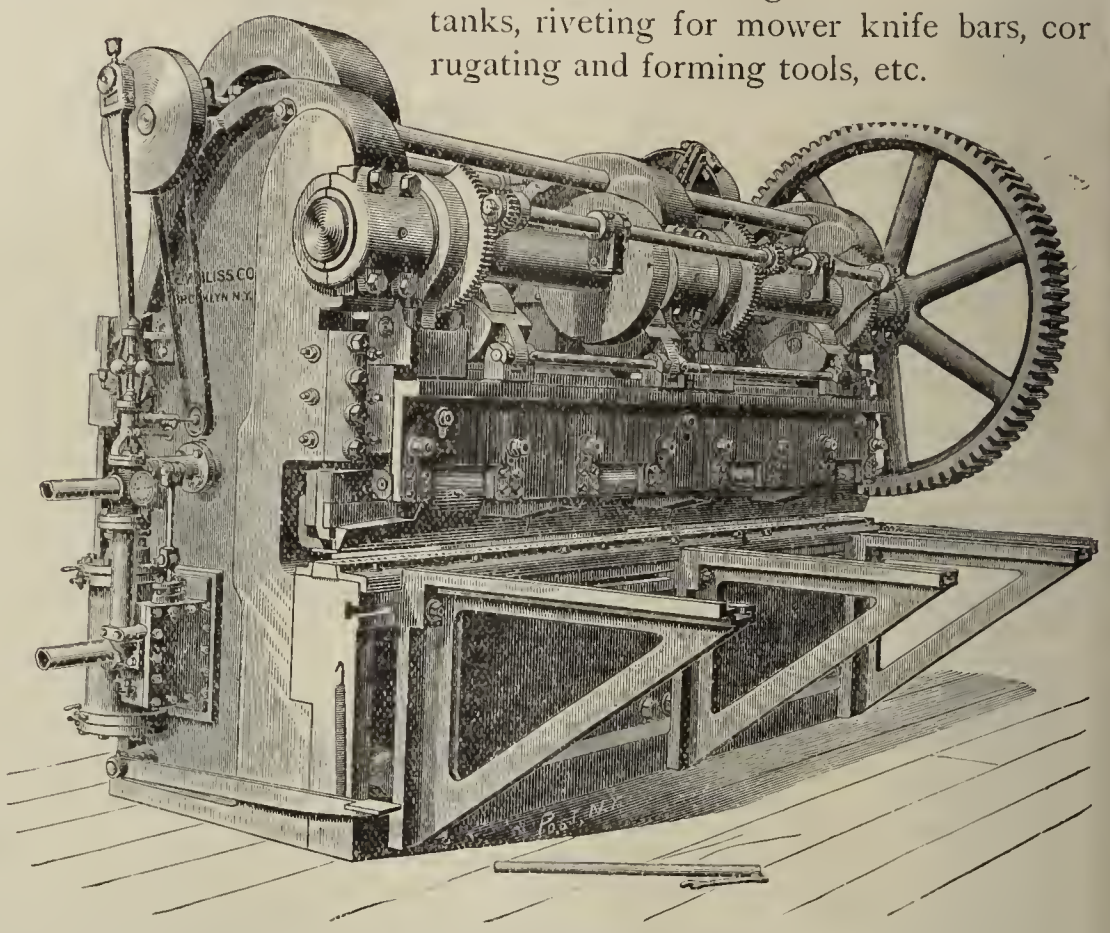
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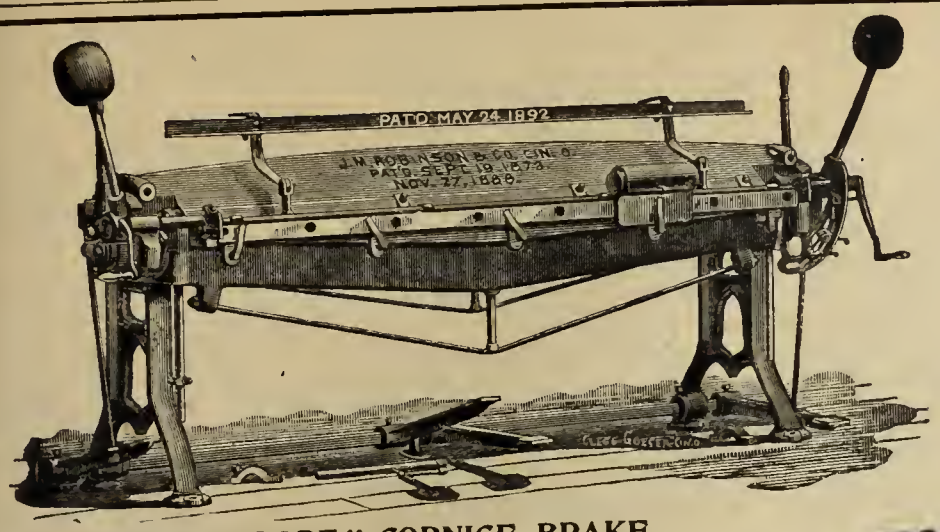
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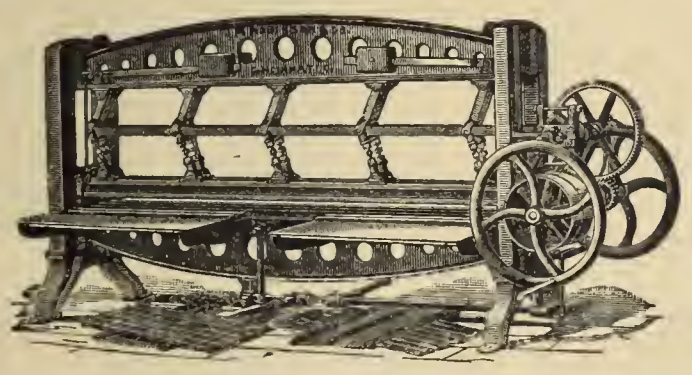


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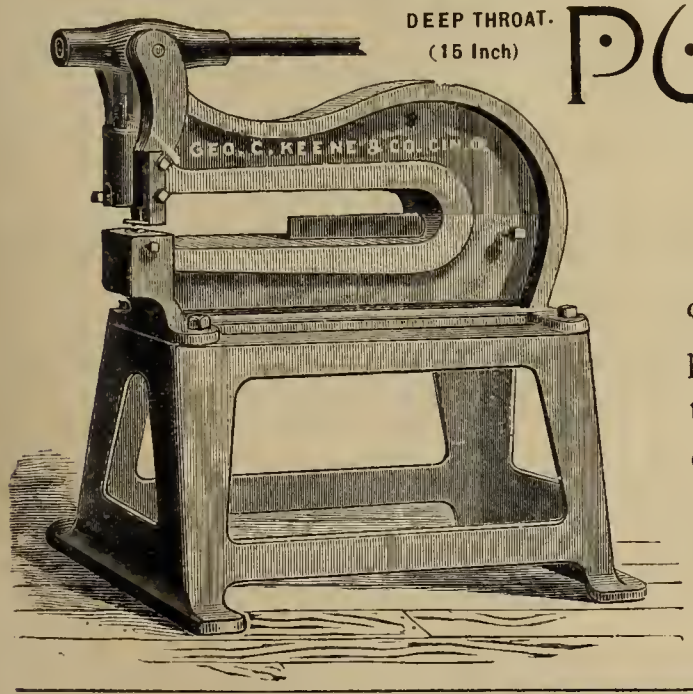
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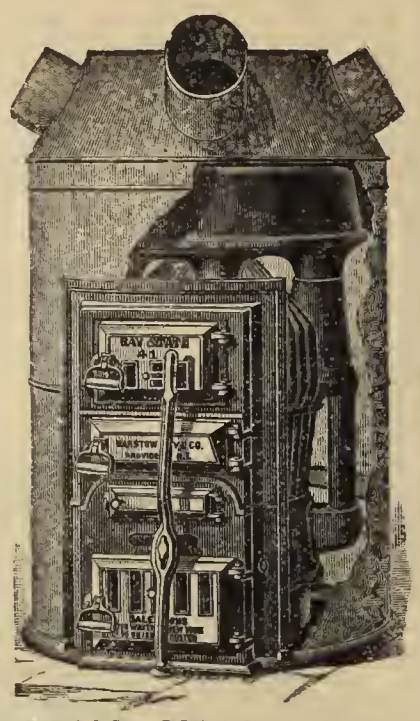
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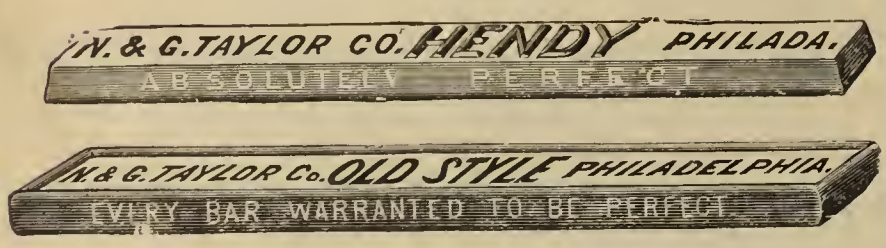
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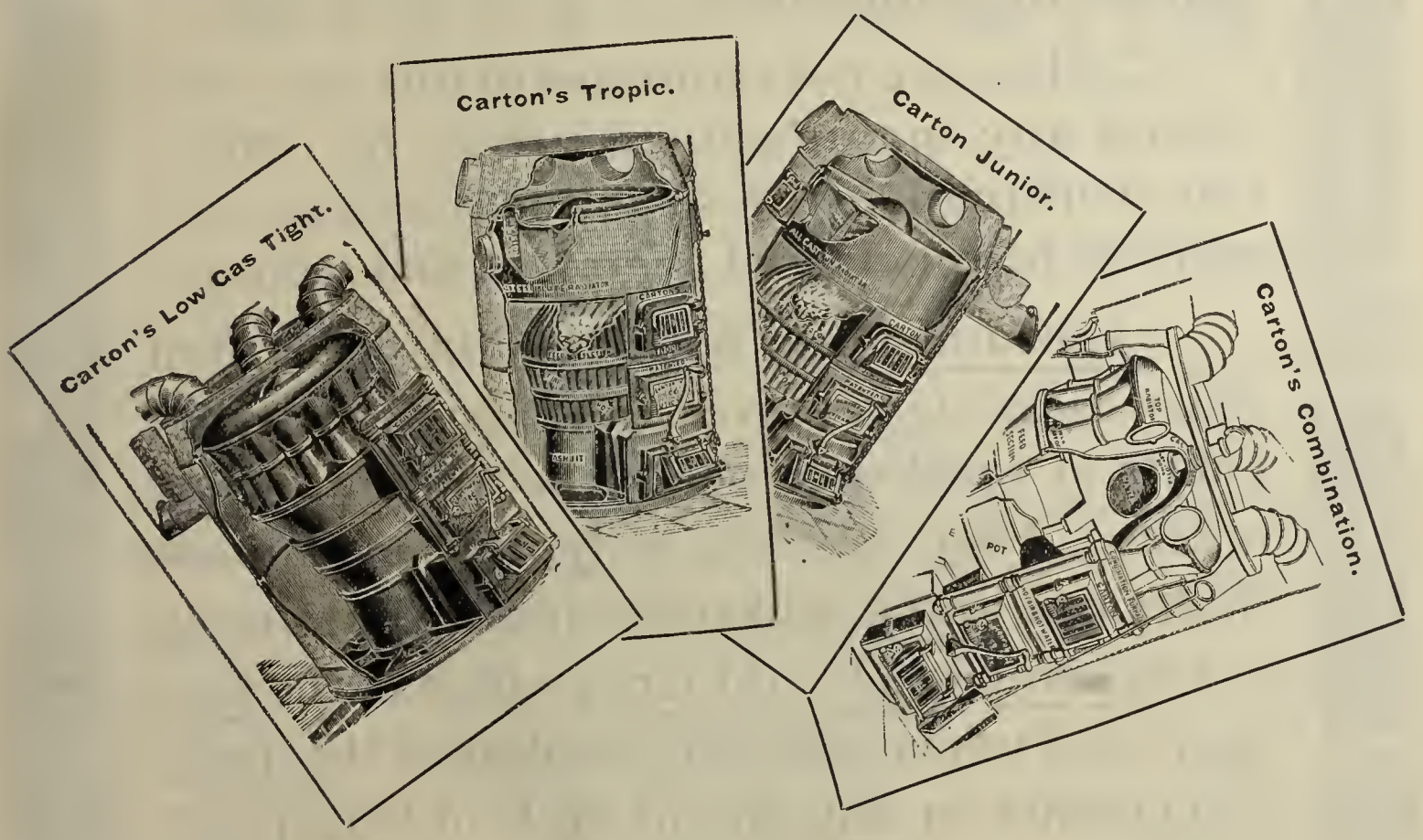


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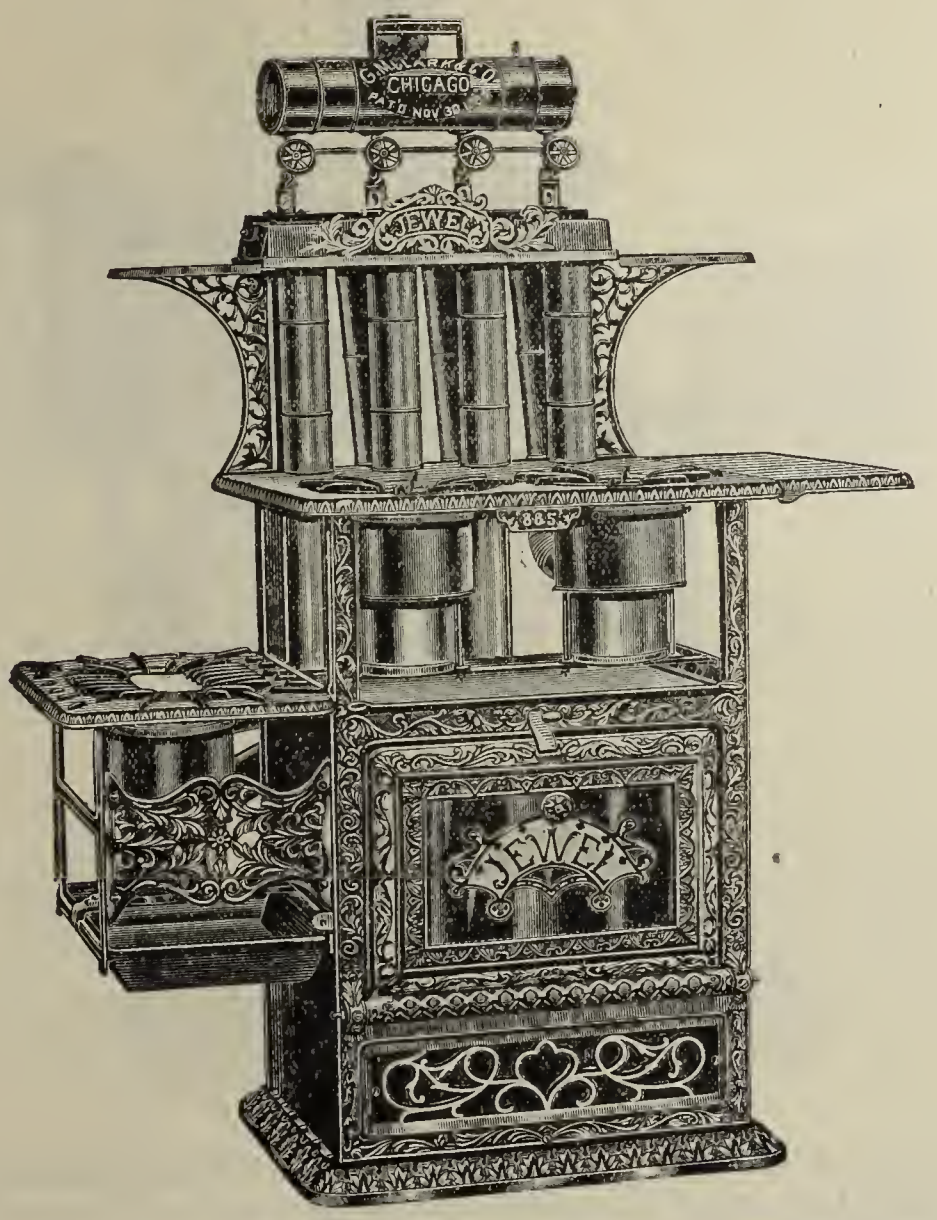
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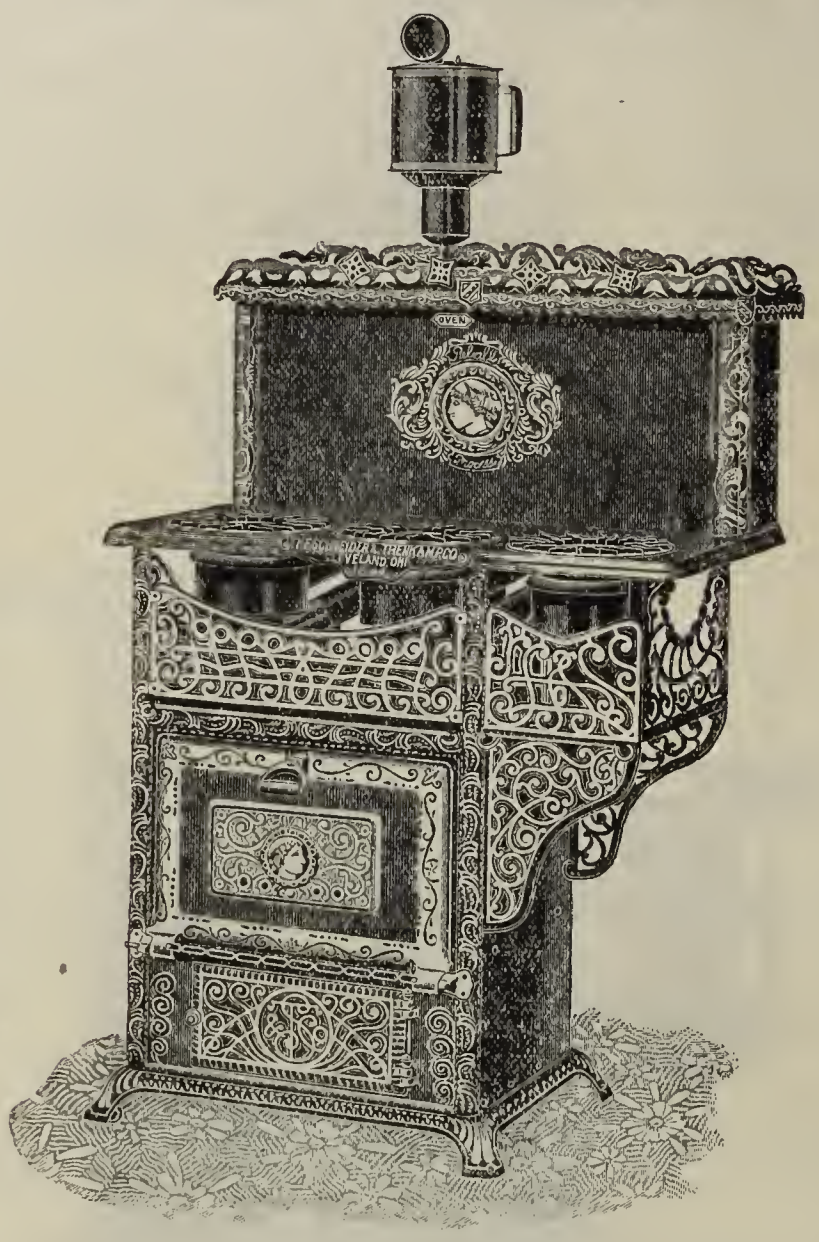
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"PERFECT SAFETY" JUNIORS ARE STILL IN THE LEAD.

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OUR PRICES ARE NOT MADE BY THE TRUST AND ARE LOWER THAN ITS PRICES.

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THE ONLY KEROSENE VAPORIZING OIL STOVE IN THE WORLD, AND THE BEST GASOLENE STOVE EVER CONSTRUCTED.

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Is a Gas produced by vaporizing any of the refined products of petroleum.



We make the **OILGAS STOVES** in six different styles and sizes (either in Cast Iron or Sheet Steel), including two sizes of the **OILGAS LAMP STOVE.**

AN UNQUALIFIED AND PRONOUNCED SUCCESS.

All of our Vapor Stoves are substantially constructed and highly ornamental, being finished in Japan, Nickel and Bronze.

This cut practically represents our Three Burner and Step Oilgas Cook Stove, showing the burner with a section of the outside jacket removed, presenting a view of the outside perforated burner wall, also showing Feed Pipe and hole in the burner for lighting.

We have in this burner everything that could possibly be desired in a burner.

1st. SIMPLICITY
2d. DURABILITY.
3d. Vaporizing ordinary kerosene oil in less than one minute from the time of first applying match.
4th. Producing a perfect blue vapor flame of intense power.
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Note only one of the many advantages that this stove has over any other vapor stove ever produced. **You can burn either kerosene or gasolene** with perfect impunity and at pleasure and **with the same satisfactory results.**

Any enterprising dealer who will push the sale of this stove **can make more money** than he has ever heretofore dreamed of making out of the sale of oil or vapor stoves.

That our Oilgas Cook Stove is a pronounced success in the hands of every intelligent user is more than ever assured by he rapid increase in our sales and the glowing testimonials that we are daily receiving from those who have used the stove during the past season.

Less than two years ago we first introduced our Oilgas Cook Stove to the public. It has grown in popular favor since the very day of its first introduction.

We are the only manufacturers in the world of an Oil Vaporizing Stove and the largest manufacturers of Oil and Gas Stoves. Over two hundred different styles and sizes for cooking and heating purposes; also miscellaneous articles, such as Nursery Burners, Glue Pot Heaters, Gas Irons for Tailors and Dress Makers, Chemical Stoves, Lanterns, Glass Oil Cans, etc., etc.

The following named **Lamp Stoves** are well and **favorably known** to the trade and public:

American, Fairy Queen, Gypsy, Sun, Champion, Florence, Iron Clad, Tom Thumb, Columbia, Globe, Monarch, Volunteer, Reliance.

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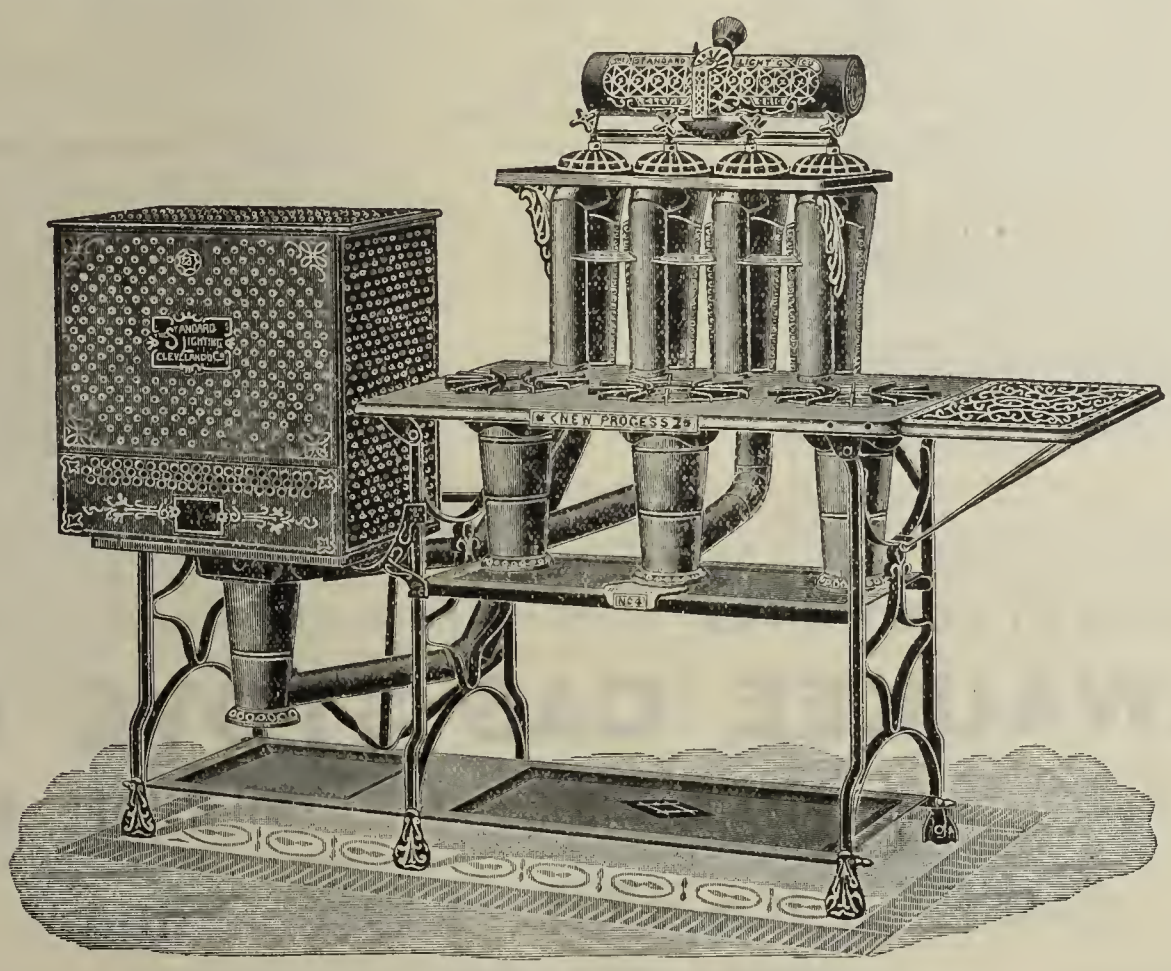
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COOKING MADE EASY.

Success the Proof of Merit!

Over a Quarter Million "New Process" (evaporating)
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For 1894 equipped with brass hot air pipes, improved sight feed, removable drip valves with anti-rusting points, **cleanable reservoir** and handsome steel oven, Russia iron finish, asbestos lined. The best baker made!

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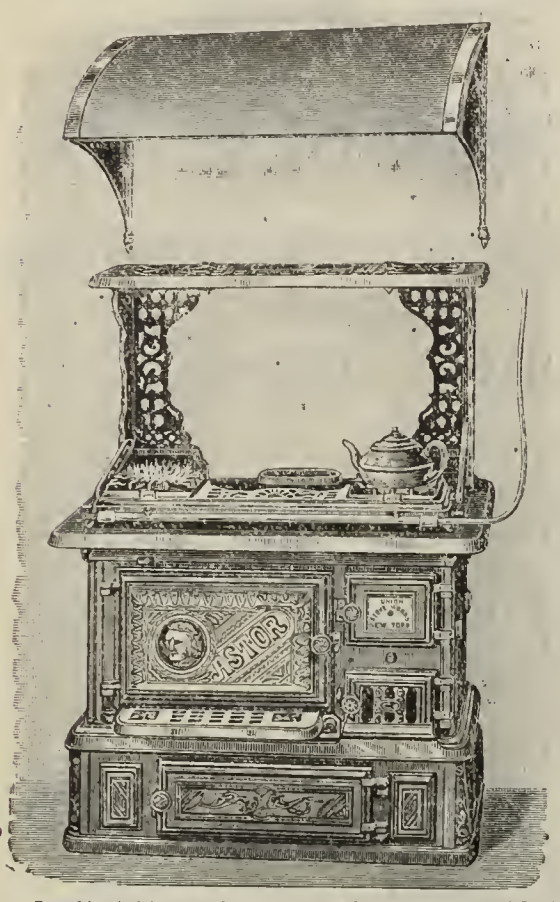
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NEW - PATENT - GAS - STOVE - ATTACHMENT.

PATENTED FEBRUARY 20th, 1894.

The only Practical, Common Sense Gas Stove Attachment for Cook Stoves and Ranges made.

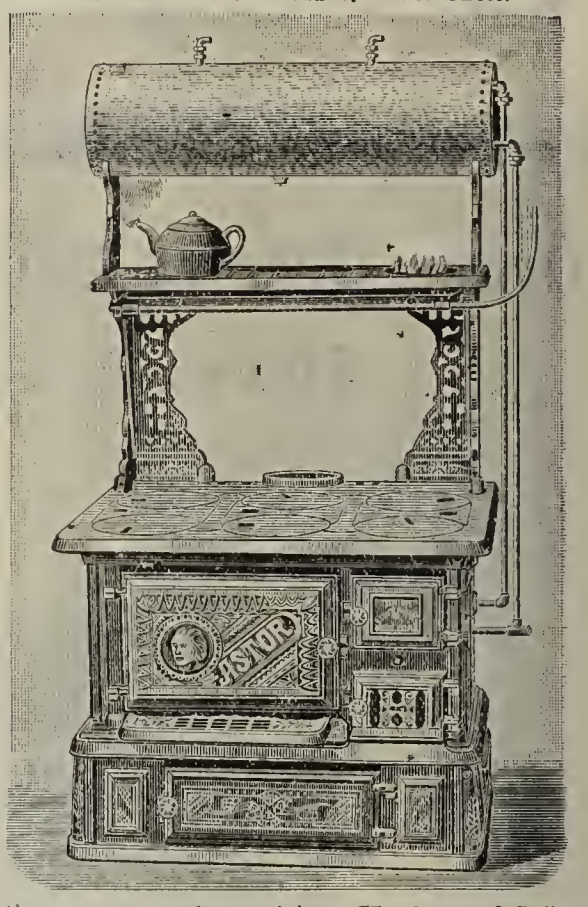
Gas Attachment Lowered to Range.



Adjustable to Our

No.	70	Astor.
"	7	"
"	2	"
"	3	"
"	3	West End.
"	8	Bon Bon.
"	3	"
"	8	Home Run.
"	3	" "
"	8	New Rival.
"	3	" "
"	8	Lakewood.
"	8	New Paragon.
"	9	" "
"	3	" "
"	4	" "
"	8	Durham.
"	3	"
"	8	Massena.
"	3	"
"	8	Paragon B.
"	3	" "

Gas Attachment Swung up under Shelf.



Is adjustable to all our **Portable** Astor and West End Water Back Ranges, whether they are connected to upright or **Horizontal** Boilers Also adjustable to our No. 3 Astor and West End **Brick-Set** Ranges and to nearly all our 8 and 9 inch Portable Kitchen Ranges, as above stated

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THE UNION STOVE WORKS, 70 Beekman and 66 & 68 Gold Sts., New York. U. S. A.

MILWAUKEE GAS STOVE CO.,

OFFICE AND WORKS: 15 and 17 Erie Street, - MILWAUKEE, WIS.

OUR LEADER FOR 1894.

Features.

Adjustable valves.
Superior in design.
Excellent in workmanship.
Cleaning burner attachment.
Great efficiency in doing work.
Extreme economy in gas consumption.

The drop door, unlike those on other ranges, is entirely new, simple and durable.

OUR CATALOGUE AND DISCOUNT SHEET ON REQUEST.



Our Goods are Superior in Quality of Material used and in Workmanship.

WILL MEET THE DEMAND.

We offer this line on its merits, coupled with the fact that its price is about one-quarter below any gas range heretofore offered by us.

We carry a full line of Heaters and Gas Grates.

Manufacturers of

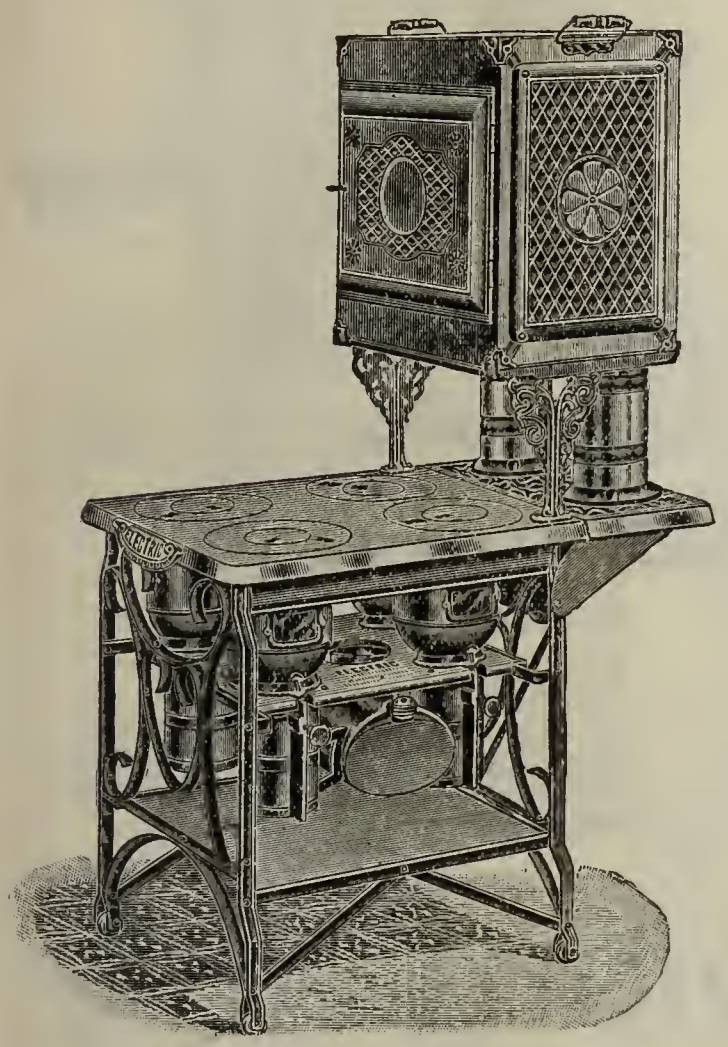
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Fire Places and Heaters
Laundry Heaters,
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Ovens, Hotel Ranges,
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Kilns for Firing Glass,
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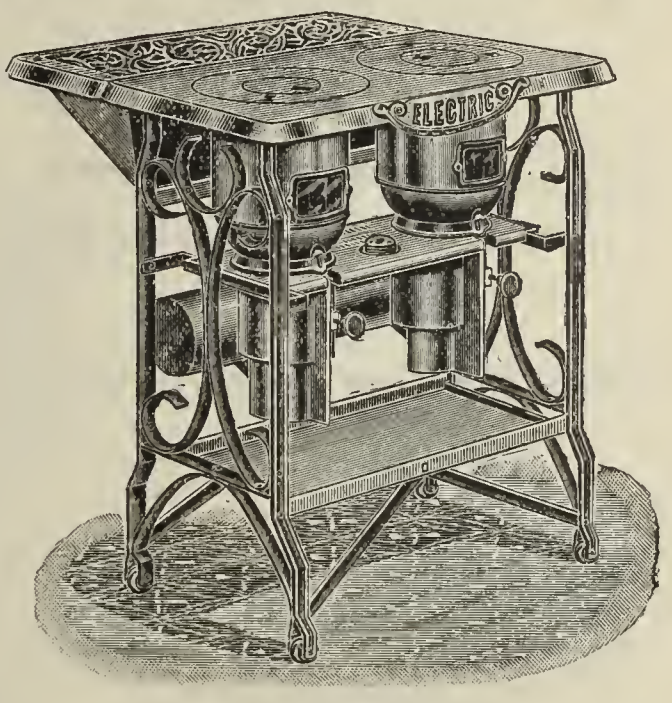
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Oil Stoves and Ranges



Electric Cabinet Oil Range No. 121.

PATENT APPLIED FOR.



Electric Range No. 40.

THE WORLD'S BEST.

Manufacture Established 1890.

Three Years of Unparalleled Success.

More than 50,000 in Successful Operation.

27,000 Sold in 1893.

The ELECTRIC the Standard of Excellence.

Our Competitors' Arguments:

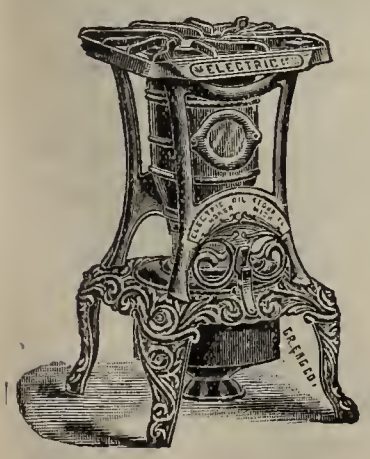
"We guarantee our Stoves equal to the Electric."

Our New Oil Cooking Stoves and Oil Ranges for 1894 are guaranteed to be absolutely the best and most perfect working Oil Stoves ever offered to the public, and have positively never been equaled in the history of the Oil Stove business. For efficiency, capacity and general cooking purposes they are warranted to be equal to any gasoline stoves manufactured. For safety to life and property, convenience of operation, ease of management and keeping in repair, are guaranteed superior. Write us for descriptive circulars.

Our Central Draft Lamp Stoves for '94 are better than ever, and for special work, baking and light housekeeping, cannot be excelled. Two years of successful operation is sufficient to recommend them to the confidence of the trade.

SPECIAL ANNOUNCEMENT.

For the coming season we shall have the most complete line of practical Electric Oil Heaters ever offered to the trade. Do not place your orders without consulting us. Write for our new catalogue, ready to mail April 1st.

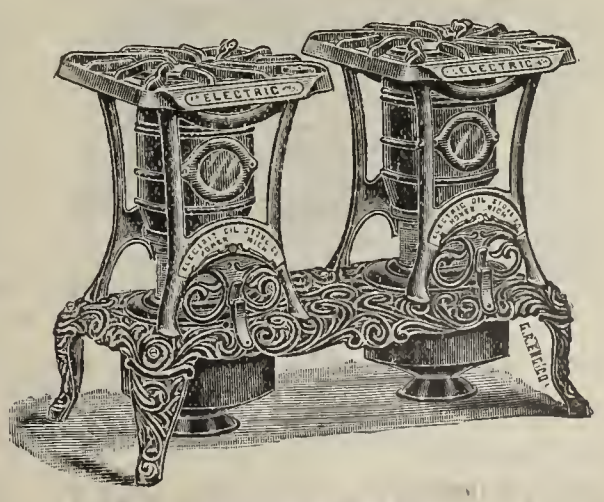


No. 1 Electric Lamp Stove.

Electric Oil Stove Co.,

HOMER, MICH.

The Largest Manufacturers of Round Wick Central Draft Oil Stoves in the World.



No. 2 Electric Lamp Stove.

Have you The Monarch AGENCY?

The King of ALL Gasoline Stoves.



The Baxter Stove Co.,

MANSFIELD, OHIO.

Agencies for New York, New Jersey, Pennsylvania and New England States,

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THE "ALL RIGHT"

Central Draft Lamp Stove.

ALL RIGHT in Construction. ALL RIGHT in Ornamentation. ALL RIGHT in Use.



The Pattern is Artistic in Design, Castings Fully Nickeled, Drawn Brass Oil Tank, and all Material the Best.

THE ALL RIGHT

LAMP STOVE will Bake, Boil, Broil, AT A COST OF 3 cents a day.

There is nothing like it for **Cooking** or the **Nursery** and the **Sick Room.**

The Combustion is absolutely perfect and the stove and flame free from odor. These stoves sell readily and are profitable to the dealer.

WHEN YOU PURCHASE the "ALL RIGHT," you don't buy a lawsuit. We are the originators, and the United States Courts and the Patent Office have sustained our Patents. **Write Immediately for Circulars and Prices** if you desire to handle the **All Right.**

COLDWATER OIL STOVE CO., Coldwater, Mich.

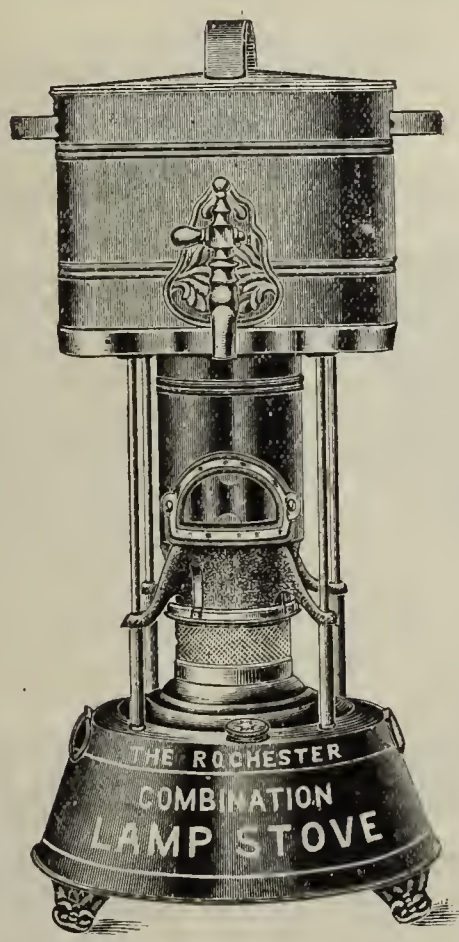
The Rochester

(CENTRAL DRAFT)

OIL STOVES.

No odor ever comes from this Stove.





Perfect combustion—equal to the finest Rochester Lamp.



A PERFECT OIL STOVE AND COMPLETE ROCHESTER LAMP ALL COMBINED IN ONE.

This new Oil Stove was brought out last season and has had a remarkable sale. It is well known that the famous Rochester Lamp has proved to be the best lamp **EVER MADE.** This is saying a great deal, for lamps have been made and used for over 3,000 years; nevertheless it is true. Our Oil Stoves and Heaters are made on the same principle as the Rochester Lamp; have the Rochester Central Draft Burner (circular wick) with double over-cone (or perforated flame spreader). All brass burner and wick-lift. Above illustrations show No. 2 size, which **CAN BE INSTANTLY CHANGED INTO A ROCHESTER TABLE LAMP** as shown. Send for our price-list and discounts to the trade.

ROCHESTER LAMP CO., 42 PARK PLACE, 37 BARCLAY STREET, NEW YORK.

A CONTINUAL PROCESSION OF



PARAGON. **FIDELITY.** **PARAGON.** **FIDELITY.** **PARAGON.**

PARAGON FURNACES and FIDELITY RANGES

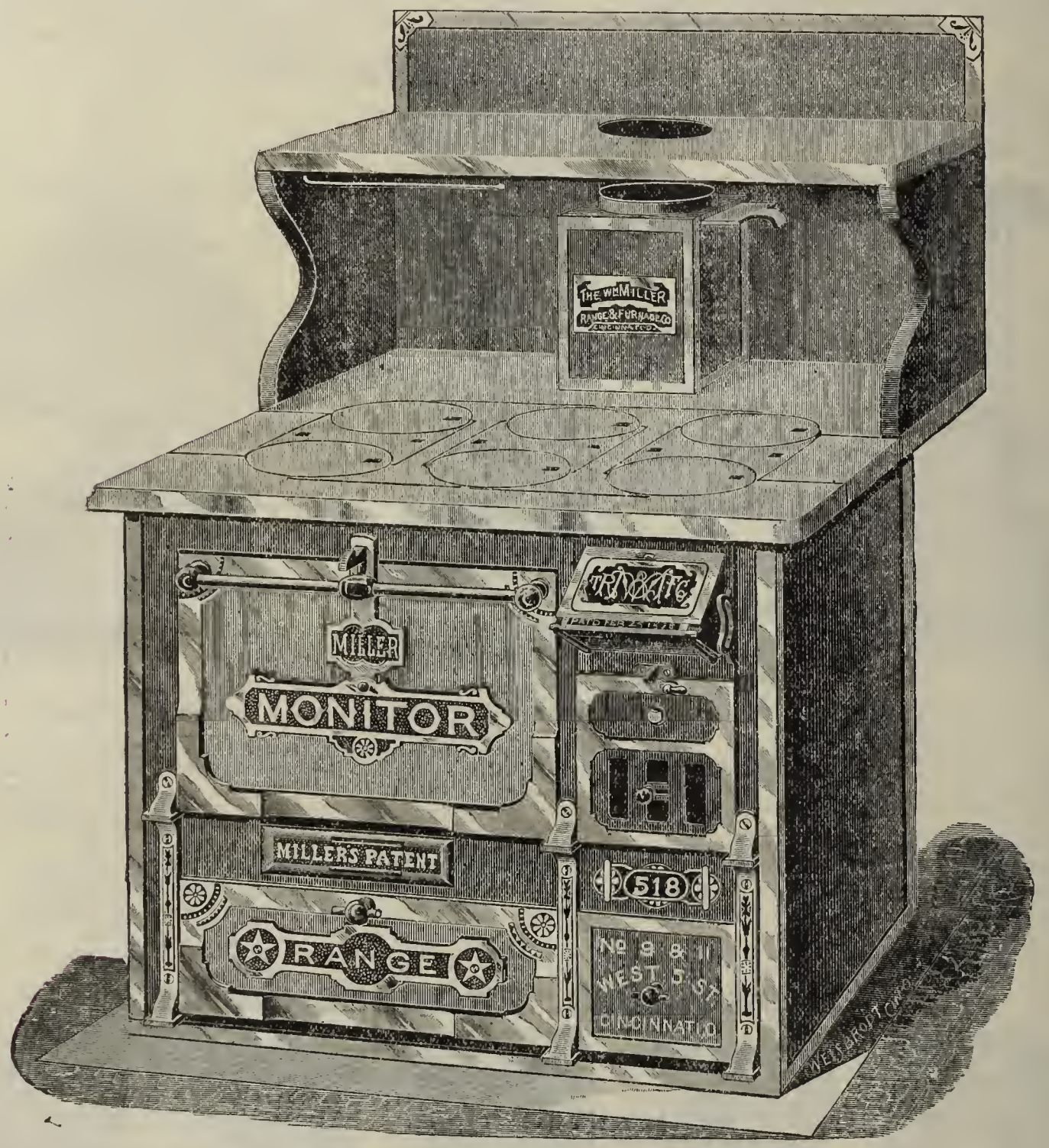
Is moving steadily from our works to the homes of delighted purchasers, by way of the stores of enterprising dealers, who have found profit in aiding the course of the procession. You can get into line if you will.

Isaac A. Sheppard & Co., Manufacturers, 1801 N. Fourth St., Philadelphia, Pa.

Miller Monitor

Wrought Steel RANGES.

The Heaviest, Best Made, Finest Finished, Most Economical and Most Durable in the Market.



FOR FAMILY, RESTAURANT AND HOTEL USE

We have the Largest Variety to select from of any house in the country They have an Established Reputation, and are used from Maine to California Agents wanted in every town. Write for Catalogue and our New Prices. We will sell you as cheap as any other house, and make it to your interest to handle these goods

All Kinds of Hotel Implements for Culinary Purposes.

—MANUFACTURED AND FOR SALE BY—

The Wm. Miller Range & Furnace Co., Nos. 9 & 11 West 5th St., CINCINNATI, O.

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MILTON ROGERS & SONS, Omaha, Neb.
HOLLY, MASON, MARKS & CO., Spokane, Wash.
TACOMA STOVE CO., Tacoma, Wash.
THE JOHN SCHRAM CO., Seattle, Wash.
F. S. LANO & CO., Helena, Mont.
H. WETTER MFG. CO., Memphis, Tenn.
HOLBROOK, MERRILL & STETSON (for Pacific Coast), San Francisco, Cal.
Z. C. M. INSTITUTION, Salt Lake City, Ogden and Logan, Utah.

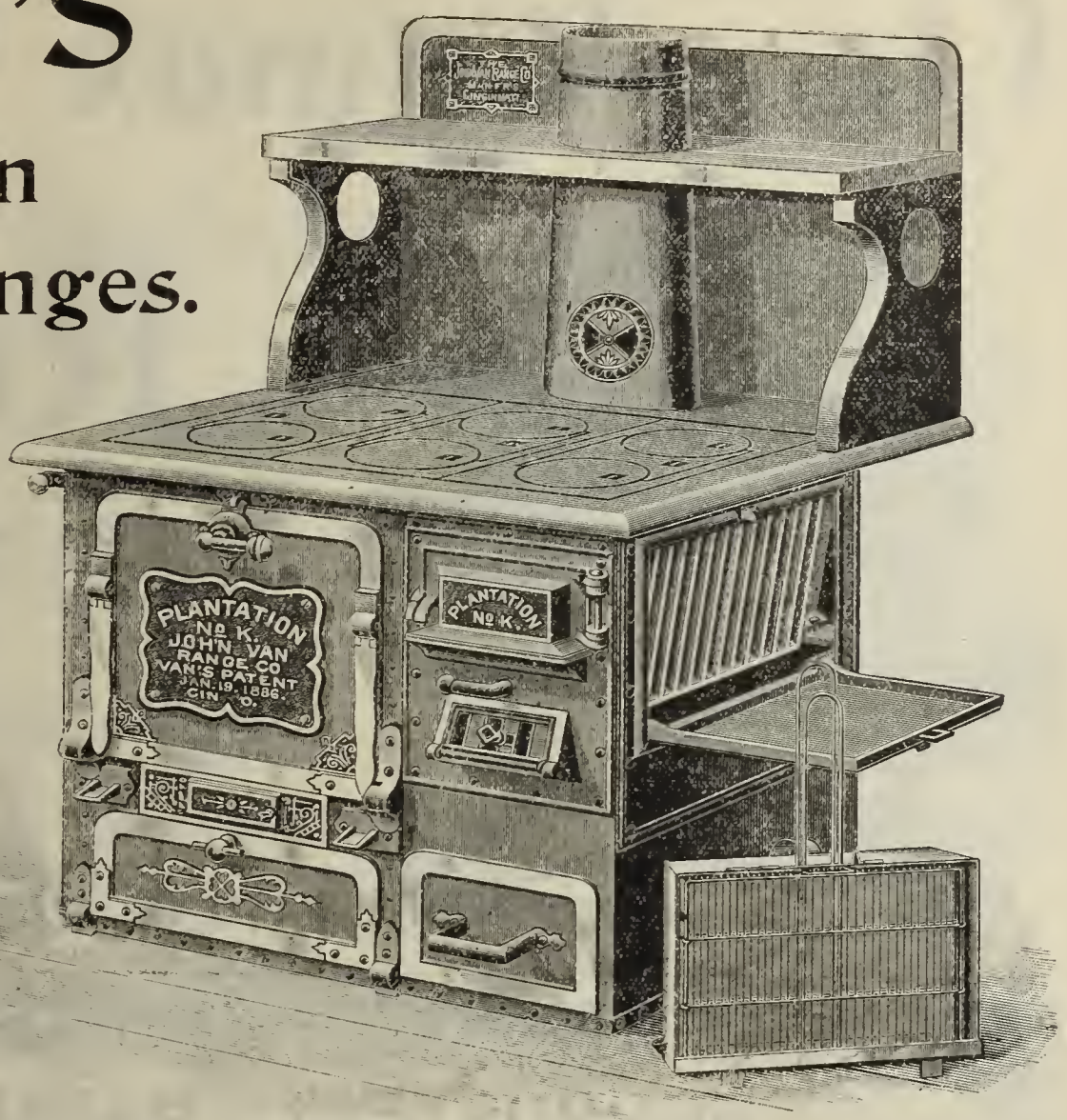
SECURE THE AGENCY FOR YOUR TOWN.

VAN'S

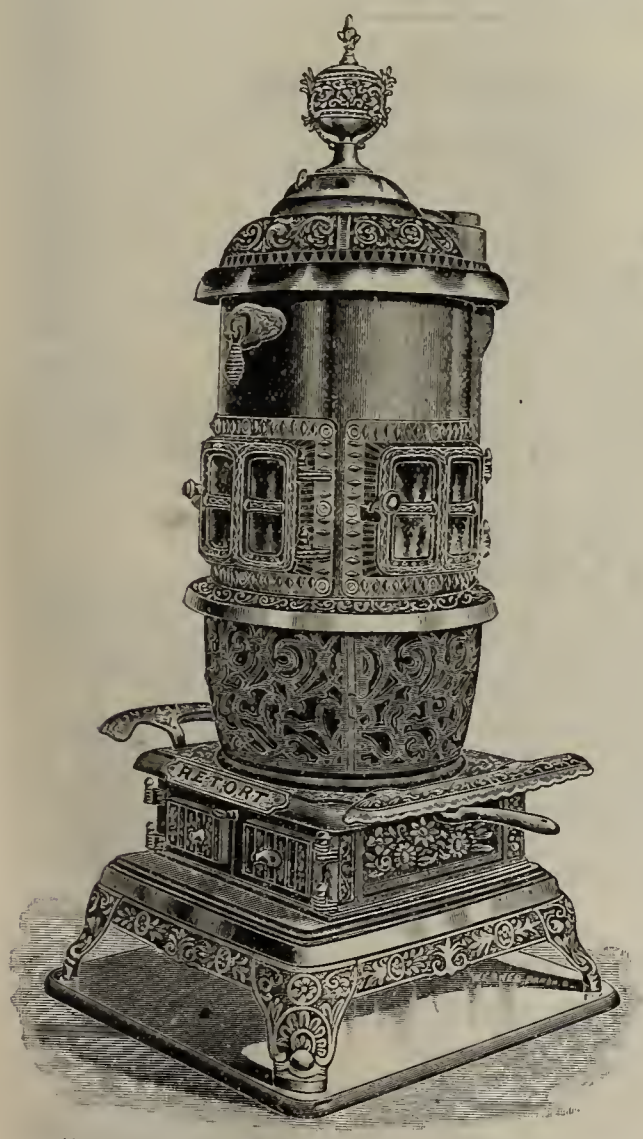
Plantation Ranges.

With Broiler Attachment.

The finest, most convenient and best family range ever offered for soft coal wood or natural gas. Write for our prices before buying elsewhere It will pay you.



THE
JOHN VAN RANGE CO.,
Mfrs. of Wrought Steel Ranges, all sizes and styles,
Cincinnati, Ohio.



"THE RETORT."
Two sizes—Nos. 16 and 18.

THE RETORT

IS THE ONLY

SELF-FEEDING STOVE

That will feed any kind of

SOFT COAL,

NO MATTER HOW STICKY.

If this be true you know the value of the *exclusive control* of a stove of this kind.

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——MANUFACTURED ONLY BY THE——

Marion Stove Co., Marion, Ind.

Gem=Climax

FOR COAL OR WOOD



Ranges

made in all the various styles and sizes. The Flattering Success of the Gem-Climax medium priced, four hole range is in keeping with all the

Climax Stoves and Ranges.

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FERROSTEEL RANGES

Originality	ARE GOOD SELLERS BECAUSE OF THEIR . .	Style and Finish . .
Material		Economy . . . . .
Construction . . .	* * * WRITE FOR CATALOGUE * *	of Fuel . . . . .
Perfect Operation . .	THE DIPPO MANUFACTURING COMPANY, Chagrin Falls, Ohio.	Low Priced . . . .

THE MAHONY BOILERS FOR STEAM AND HOT WATER HEATING



Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons. Andirons, Tiles, &c.

Office and Showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

THE VOLUNTEER

STEAM.



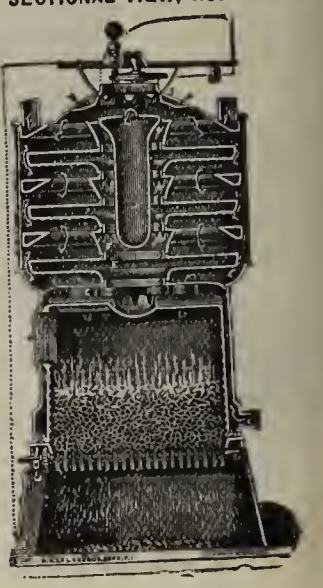
For hot water or steam has no superior, and is the only hot water boiler that is SELF REGULATING.

Send for our new catalogue, fully illustrated, testimonials, etc.

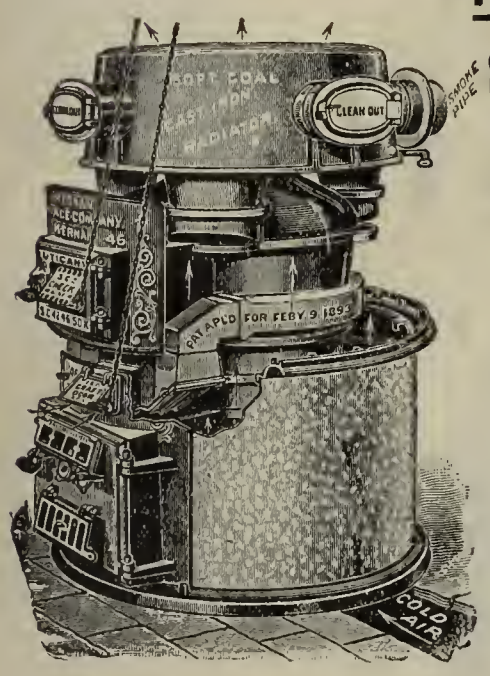
The Wm. H. Page Boiler Co.,
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These boilers have a large sale in New England.

SECTIONAL VIEW, Hot Water.



KERNAN



New Process

Smokeless

Soft Coal

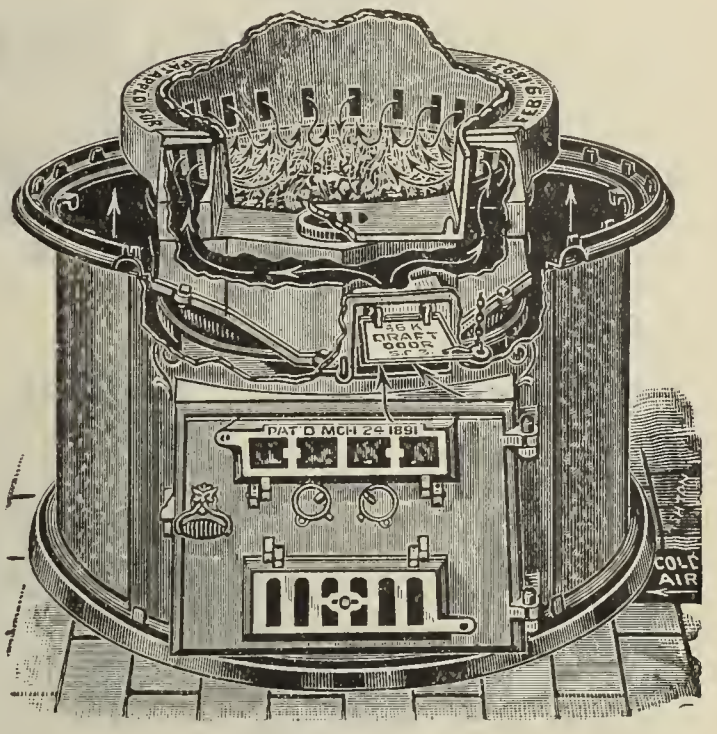
Cast Iron

Furnace.

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NO

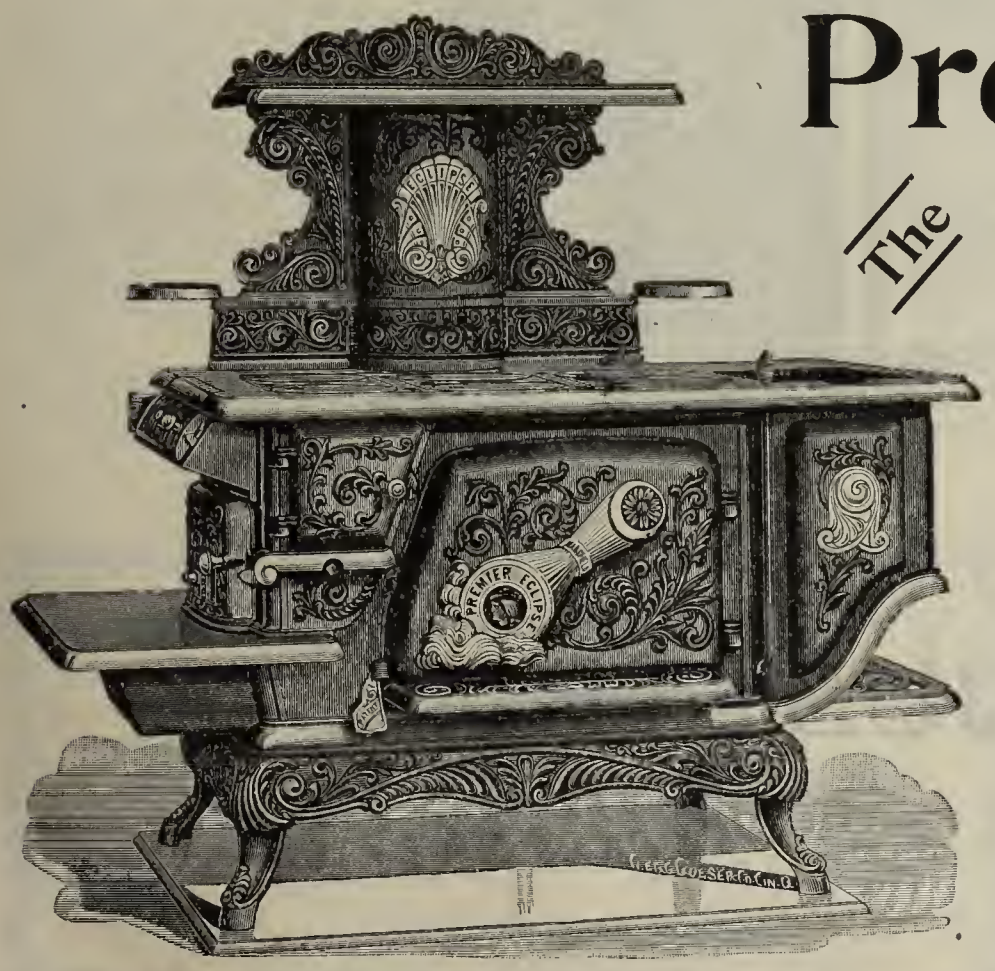
EXPERIMENT.



KERNAN FURNACE COMPANY,

71 W. WASHINGTON ST., CHICAGO. UTICA, N. Y.

Premier / The Eclipse



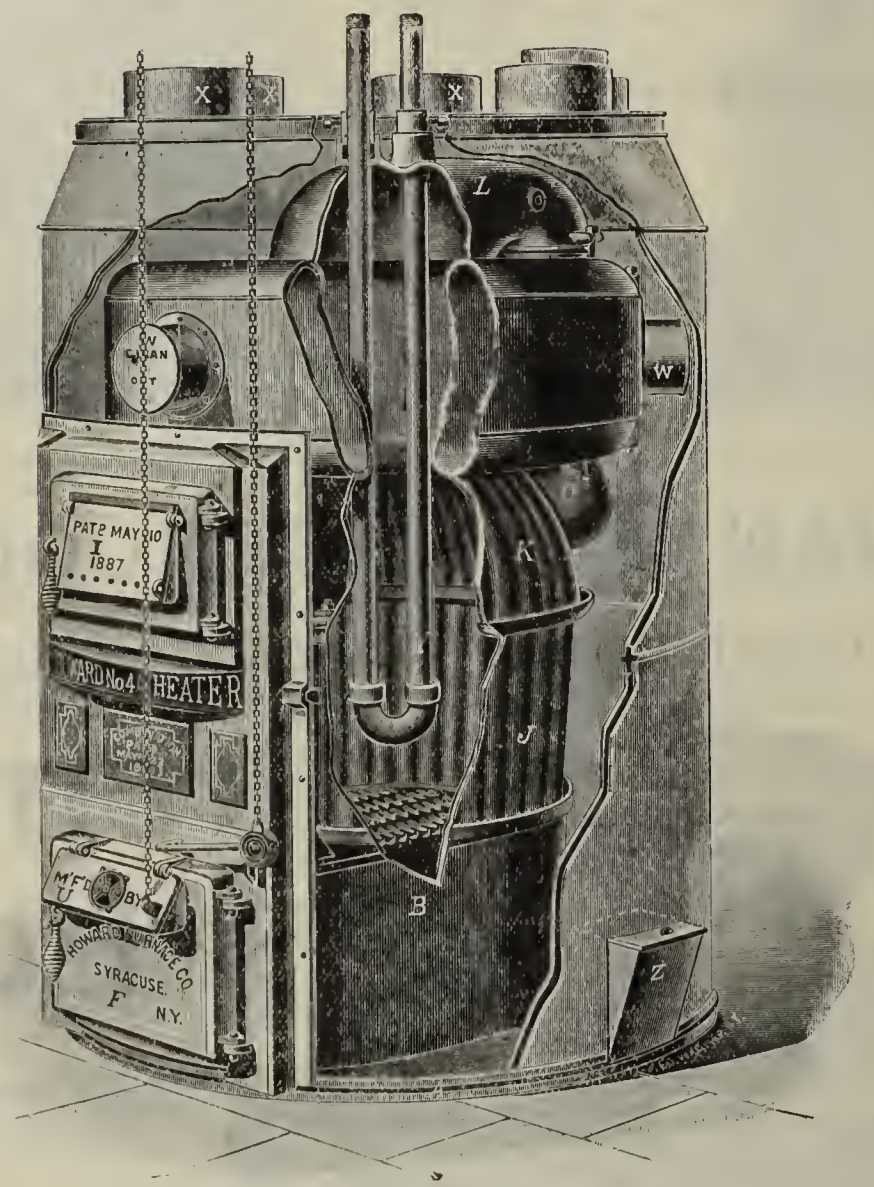
Coal or Wood. Encased Bracket Reservoir and High Shelf. Every Stove Warranted.

A RANGE that will successfully meet all requirements. Its flue construction is such as to insure a full and free circulation and the fire box affords the most perfect combustion. Castings smooth and handsomely nickeled. Trimmings of the latest styles and the entire range is fitted with ***ALL*** latest improvements and many new specialties.

Every Range Put Out on its Merits and Warranted.

The Eclipse Stove Co., (Write for Cat.) Mansfield, O.

HOWARD
COMBINATION
HEATER.



IT'S ADJUSTABLE.

WE CAN TELL MORE
WRITE TO

HOWARD FURNACE CO.,

SYRACUSE, N. Y.

New York, Boston, Grand Rapids, Toronto.

The Dunning Boiler,

—FOR—

Steam or Hot-Water Heating.

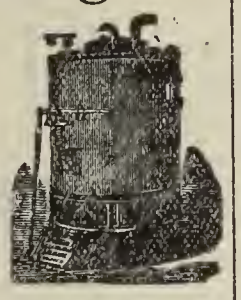


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NEW CATALOGUE

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"OUR SYSTEM."



19,000 IN USE.

71 EXCHANGE ST.,

Manufactured by

New York Central Iron Works Co., Geneva, N. Y.

Why do we Advertise?

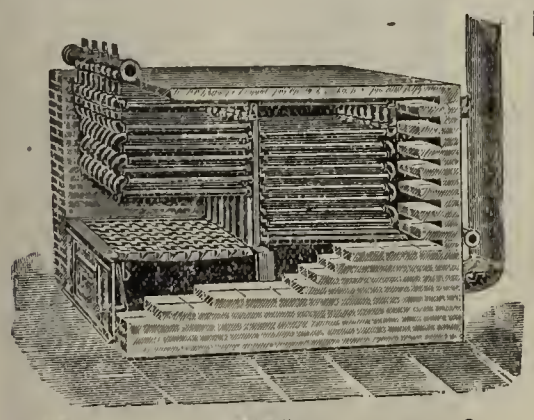
BECAUSE

Knowing as **WE** do that the Page Boiler is the best, we **WANT** you to know it too. Sold only to the **TRADE.**

SIMPLICITY, DURABILITY AND ECONOMY ARE ITS STRONG POINTS.

—SEND FOR CATALOGUE.—

W. C. MOWRY, Lock Box 314, NORWICH, CONN.



The Electric Boiler

—FOR—

Steam and Hot Water Heating and for Steam Power.

MANUFACTURED IN

Over 300 Different Sizes.

SEND FOR CATALOGUE TO

The Electric Boiler Co.,

23 and 25 STILLSON ST.,
15, 17, 19 ACHILLES ST.,
ROCHESTER, N. Y.

New York Office, 44 Dey Street.

—ORDER THE—

★ Star Water Back and Boiler Couplers ★

"No Solder." "No Bust." "No Leak."

PRICE-LIST.

FOR CONNECTING LEAD TO IRON PIPE.

	Price per doz.	Rough.	Finished.
Size, ⅜ inch Lead to ¾ inch Iron Pipe,	- -	$8.00	$9.50
" ¾ " " ¾ " " "	- -	8.50	10.00
" ⅜ " " 1 " " "	- -	9.00	10.50
" ¾ " " 1 " " "	- -	9.50	11.00
" ⅜ " " 1¼ " " "	- -	10.00	11.50
" ¾ " " 1¼ " " "	- -	10.50	12.00

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Size, ⅜ inch Lead to ⅜ inch Lead Pipe,	- -	$7.50	$9.00
" ¾ " " ¾ " " "	- -	8.50	10.00

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Send for descriptive Price-List, Catalogue with terms and discounts.

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THE HELPER STEEL RANGES BEST ON EARTH 100 STYLES & SIZES PATENT OVENS

THEY SELL EASILY BECAUSE

They have points about which YOU CAN TALK,

Points that never fail to PLEASE BUYERS.

THE GOOD POINTS

Of these Ranges are so good that the buyer at once admits their excellence.

Drop us a postal card and we'll tell you what THESE GOOD POINTS ARE.

CHICAGO & ERIE STOVE CO.,

CHICAGO, ILL. ERIE, PA.

Luther & Lederhos,

MANUFACTURERS OF



Gas and Oil Stoves,

30 Cliff St., N. Y.

Write for Catalogue and Prices.



— PAPA WAS CROSS.—Mamma: "I wonder what your papa is stamping around about?"

Little Boy: "I don't know. I didn't go into his room, 'cause he acted cross."

Mamma: "Maybe he can't find his razor."

Little Boy: "Yes, he can, 'cause I put it right back where he keeps it, as soon as I got through takin' up tacks."—*Good News.*

— BABY: "Wa-veow-oo!"

Wife: "Quick, John, the baby's fallen into the buckwheat jar! Quick, on your life!"

Absent-minded Student: "No hurry; a great principle is involved. That child, madam, has reversed the plan of the solar system—"

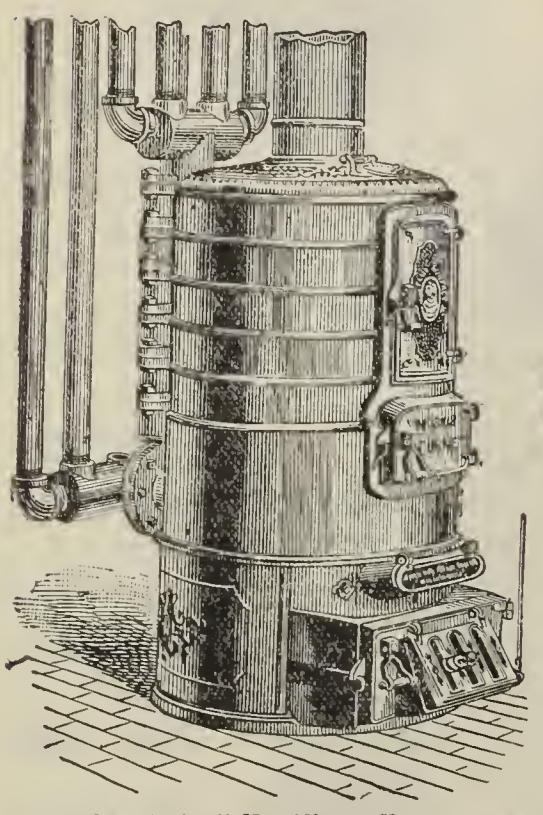
"What do you mean, you fool?"

"Don't you see, madam, that the son sets in the yeast?"—*Cleveland Plain Dealer.*

— TODDLE: "I don't see why you should envy Nibbles. He's in bed with a cold."

NODDLE: "Ah, but he caught it in London."—*Chicago Record.*

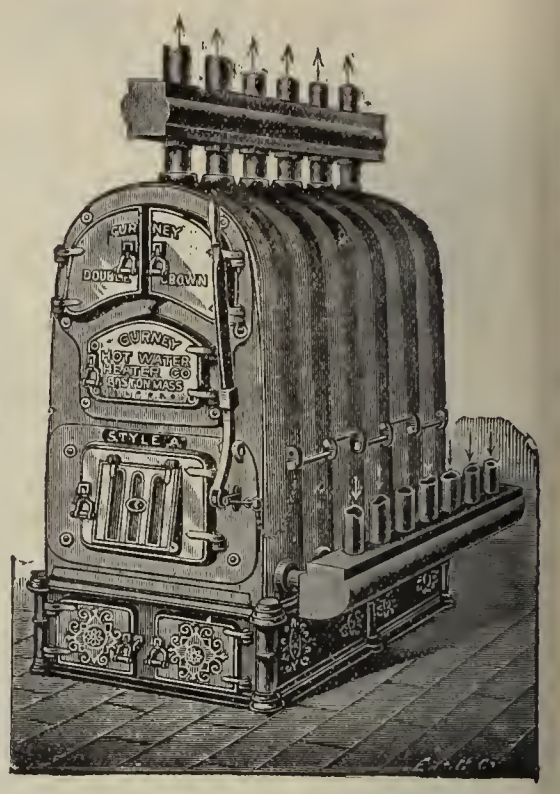
GURNEY



"300 Series" Hot Water Heater.
For Hard or Soft Coal. Capacities 275 to 1850 sq. ft.

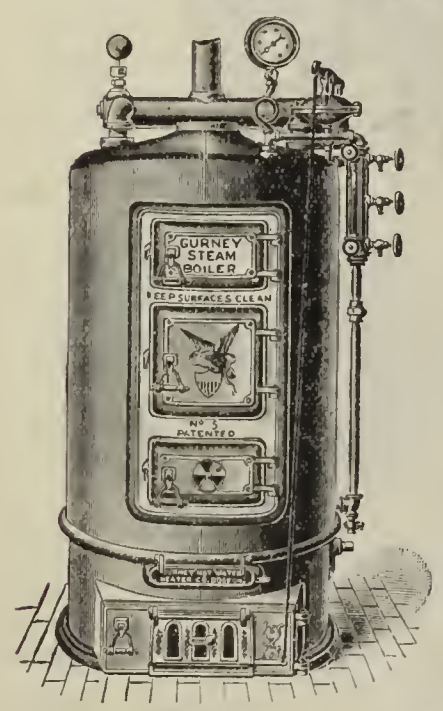
HOT WATER HEATERS, STEAM BOILERS AND RADIATORS.

1894.



"Double Crown" Hot Water Heater.
Made in three styles, A, B or C. Capacities from 750 to 6000 sq. ft.

ALWAYS LEADING BY THEIR MANY MERITS.



Perspective View
Gurney Steam Boiler.

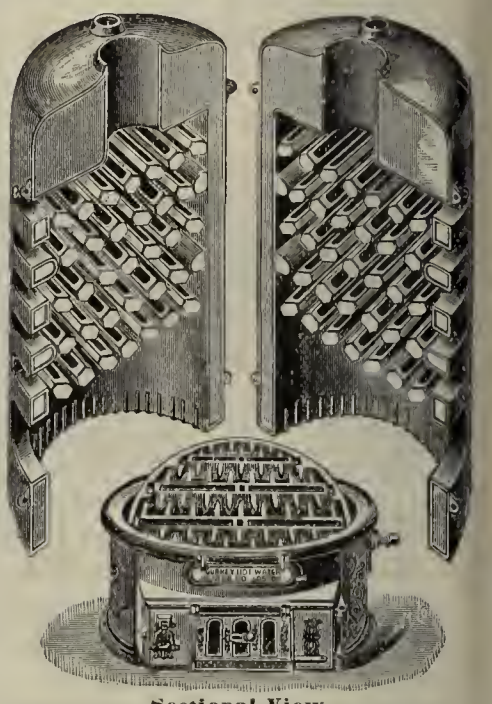
What W. J. Balding, M. E., New York's leading engineer, says of the recent test of this steam boiler:

"The performance of the boiler during the trial was admirable, being steady and reliable so that the steam did not vary ½ pound in pressure at times of firing."

And he further states:

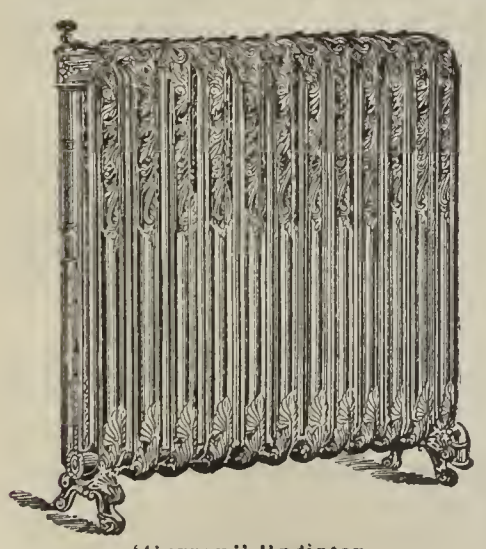
"I never tested a boiler that gave as high an efficiency of evaporation per sq. ft. of average boiler surface."

Capacities from 350 to 1300 sq. ft. direct radiation.



Sectional View
Gurney Steam Boiler.

EMBODY ALL APPROVED FEATURES OF MODERN SCIENCE.



"Gurney" Radiator.
For Hot Water.

We Invite Correspondence

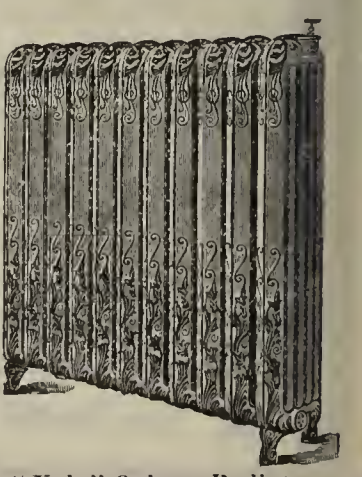
Send for Trade Catalogues.

Gurney Hot Water Heater Co.,

163 FRANKLIN ST., COR. CONGRESS,

BOSTON, MASS.

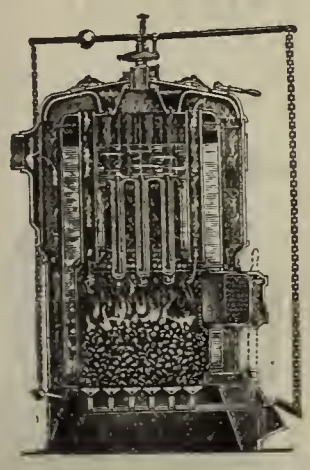
SELLING AGENCIES:
JOHNSON & CO., 71 John Street, New York.
J. C. F. TRACHSEL, 246 Arch Street, Phila., Pa.



"Yale" Quintet Radiator.
For Hot Water or Steam.

WHO TRIED TO BLOT US OUT?

HA. — HA. THIS WE ARE HAPPY TO SAY CANNOT BE DONE, AS THE SUN HAS COME TO STAY, AND ITS FAME. CANNOT BE OBLITERATED BY THE PETTY ATTACKS OF ITS COMPETITORS:

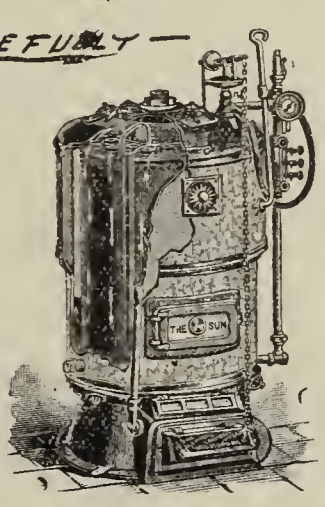




"THE SUN" DO MOVE:

THIS MAY NOT BE THE CASE, WITH THE CELESTIAL ORB, YET IT IS TRULY THE CASE WITH THE LINDEMUTH SUN STEAM AND HOT WATER BOILERS. THE GREAT DEMAND THAT HAS BEEN CREATED, CERTAINLY MAKES THIS BOILER MOVE RAPIDLY. THIS ASSURANCE WE CAN ILLUSTRATE TO YOU VERY CLEARLY IF YOU WRITE TO US FOR OUR CATALOGUE GIVING TESTIMONIALS, REFERENCES, ETC, AND YOU WILL BE STILL MORE CONVINCED IF YOU MAKE APPLICATION FOR THE AGENCY, AND USE THEM IN YOUR WORK, AS THEY CERTAINLY DO THE SUN.

THE SUN BOILER IS BUILT FROM THE MOST CAREFULLY SELECTED STEEL PLATE, BY THE BEST WORKMAN-SHIP, ON THE MOST SCIENTIFIC PRINCIPALS, INSURING THEREBY THE GREATEST ECONOMY IN FUEL, AND READINESS OF HANDLING WITH THE LEAST AMOUNT OF ATTENTION, AND THE GREATEST EASE OF MANAGEMENT.



CONSIDERING THE QUALITY OF THE BOILER, OUR PRICES ARE SUCH AS WILL MEET COMPETITION, THEREFORE WE SOLICIT YOUR APPLICATION FOR PRICES, DISCOUNTS, AND CATALOGUE.

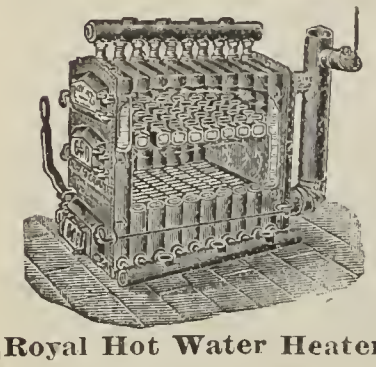
MANUFACTURED BY

THE RAYMOND AND CAMPBELL MFG CO.

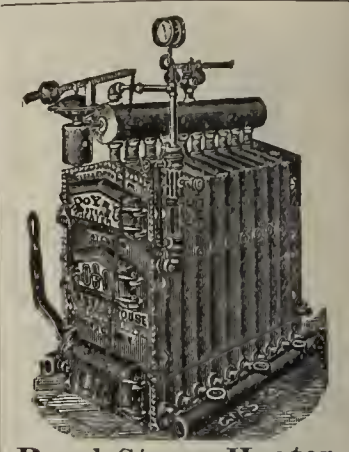
MAIN OFFICE AND WORKS — MIDDLETOWN, PA.
NEW YORK STORE AND WAREHOUSE — 244 WATER ST.
BOSTON AGENCY — 4 OLIVER ST.
PHILADELPHIA AGENCY — 45 N. SEVENTH ST.
CLEVELAND AGENCY — 1463 WILLSON AVE.
WASHINGTON AGENCY — 1237 NINTH ST. N.W.

Sold on their Merits,

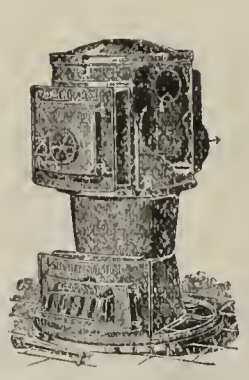
and not on their Antiquity.



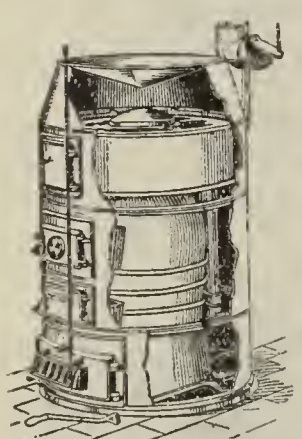
Royal Hot Water Heater.



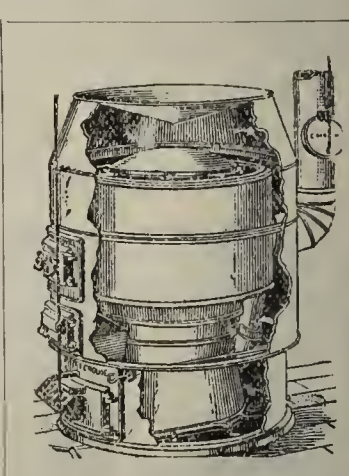
Royal Steam Heater.



Imperial Hot Air Furnace.

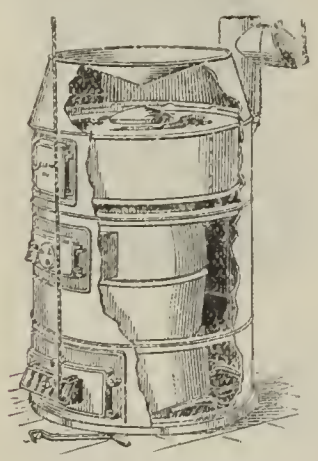


Royal Hot Air Furnace.

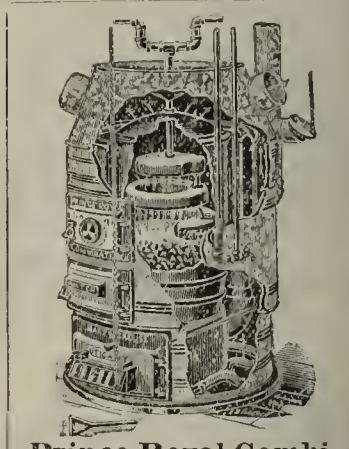


Prince Royal Hot Air Furnace.

ROYAL HEATERS



Royal Victor Hot Air Furnace.



Prince Royal Combination Heater.

Hart & Crouse,

No. 1 Cornelia Street, UTICA, N. Y.

CHICAGO, 113 LAKE STREET.

W. M. MACKAY, Manager Hot Water and Steam Dept., No. 211 Water St., New York.



WE'RE GOIN' HOME.

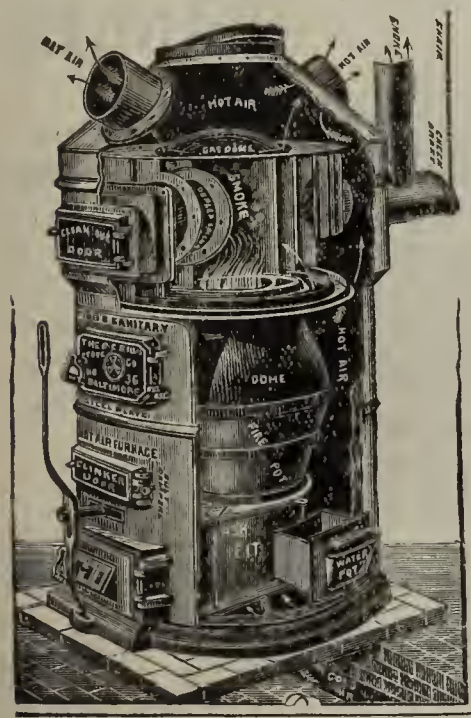
IT'S TOO HOT FOR US.

THE FRONT RANK STEEL FURNACE,

Like all other good things, is copied and counterfeited. Be sure you get a "Front Rank." We sell furnaces *ONLY.* Consequently it is not a side line. For prices, &c., address

FRONT RANK STEEL FURNACE CO.,

713 North Main St., - - St. Louis, Mo.



THE B. C. BIBB STOVE CO.

BALTIMORE, MD.,

Manufacturers of

THE BIBB SANITARY

HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

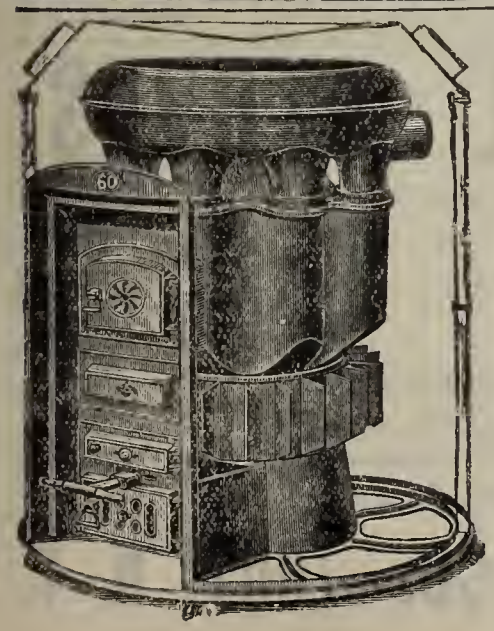
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Baltimore Fire Place Heaters

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW-WARE, &c.

Send for Catalogue with Testimonials.



CORY'S

Excelsior Gas-Tight Furnaces

For Anthracite or Bituminous Coal.

17 Sizes, Portable and Masonry.

From $35 to $125.

All cast iron Furnace. Each section cast in a *single piece*, without bolts, putty or sheet-iron connections. Solid, heavy and gas-tight. Many of the better furnaces made during the past ten years copy this design in part, but fail to add enough radiating surface over the fire-pot to obtain the best results. Send for circular. Manufacturers,

UZAL CORY & CO.,

Established 1847.

210 WATER ST., NEW YORK.



Exercise and Health.

The late Lord Derby, in the course of an address delivered to a body of students, not long ago, made the following weighty remarks, on the importance of exercise as a means for promoting physical health: It is important to notice how much depends on what students and young men are apt to despise as below their notice—I mean a perfectly sound physical condition. Take two men, if they could be found, exactly alike in mental and bodily aptitudes, and let the one go on carelessly and idly indulging his appetites and generally leading a life of what is called pleasure, and let the other train himself by early hours, by temperate habits and by giving to muscles and brain each their fair share of employment, and at the end of two or three years they will be as widely apart in their capacity for exertion as if they had been born with wholly different constitutions.

Without a normal healthy condition there can, as a rule, be no good work, and though that qualification cannot absolutely be secured or preserved by any rules, a little common sense and care will go a long way both in securing and preserving it. On that point I will just give these hints: First, that it is not mental labor that hurts anybody, unless the excess be very great, but, rather, fretting and fidgeting over the prospect of labor to be gone through, so that the man who can accustom himself to take things calmly, which is quite as much a matter of discipline as of nature, and who, by keeping well beforehand with what he has to do, avoids undue hurry and nervous excitement, has a great advantage over one who follows a different practice. Next, I would warn you that those who think they have not time for bodily exercise will sooner or later have to find time for illness.

Coating Metal with Glass

The coating of metal surfaces with glass has, it appears, been successfully accomplished. The coating mixture used is obtained, says an exchange, by melting together about 125 parts, by weight, of ordinary flint glass fragments, 29 parts carbonate of sodium, and 12 parts of boric acid; the fused mass is poured out upon some cold surface, as of stone or metal, and pulverized when cool; then of this mixture a powder is made with silicate of soda (water glass)—solution 60° Baumé—and with this coat the metal is glazed, being heated in a muffle or other furnace until it has arrived at the requisite fusion. This coating is represented as adhering very firmly to steel or iron.

— Is He Good Enough?—"What is your idea of a dude?" he asked of a bright Washington girl.

"A dude," she answered after reflection, "is a young man who isn't good for anything except to hang a chrysanthemum on."—*Washington Star.*

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

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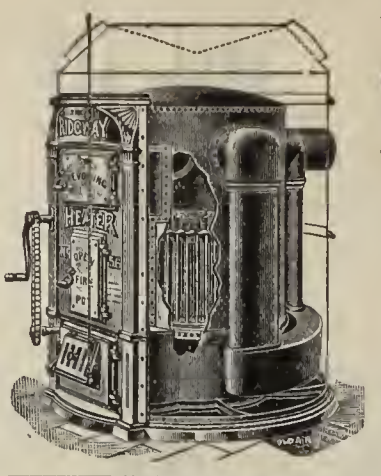
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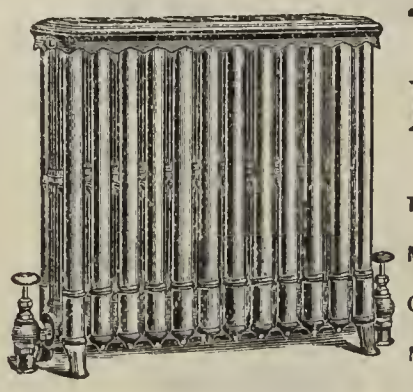
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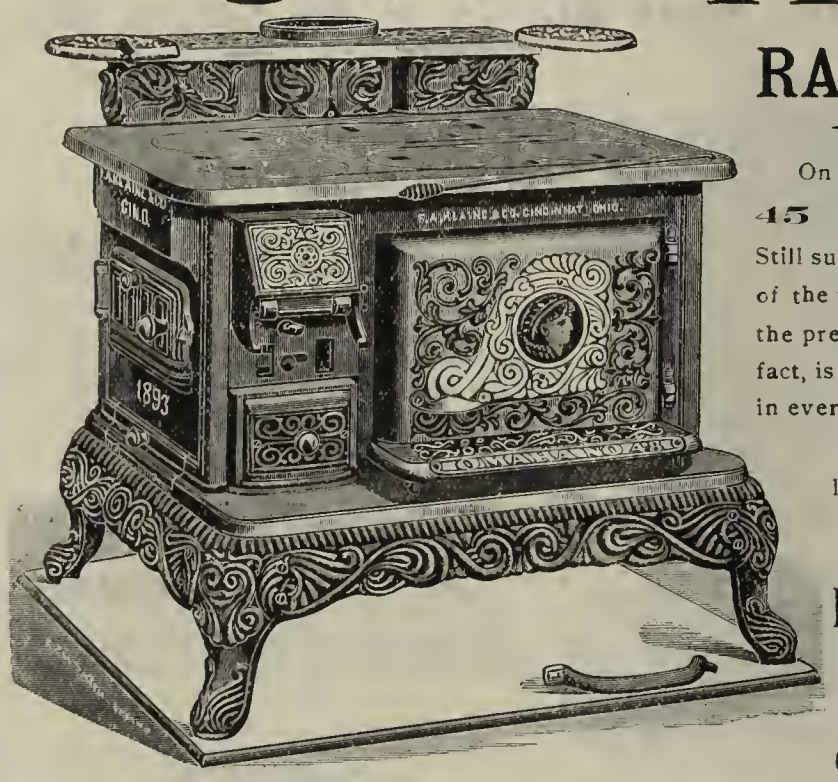
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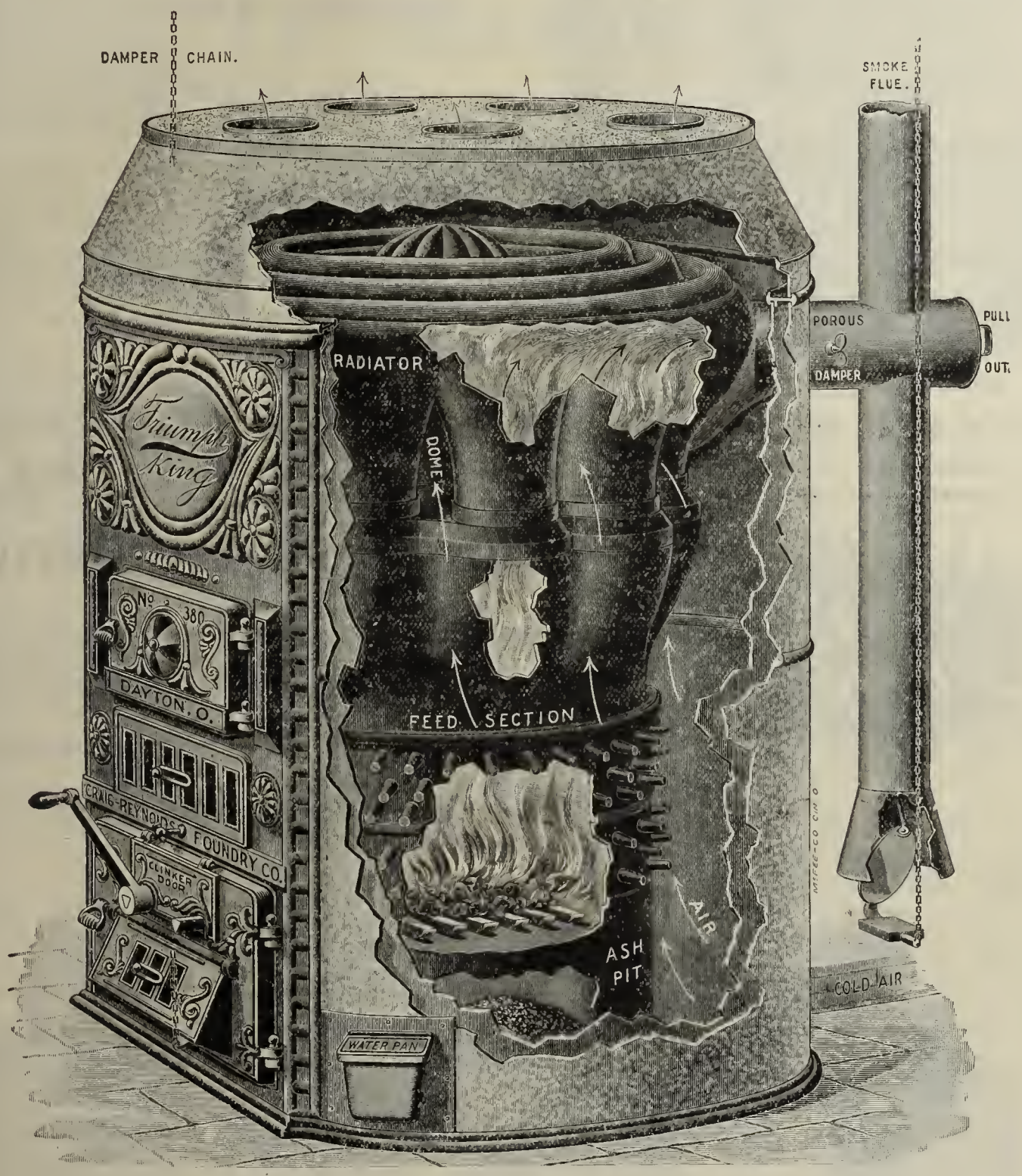
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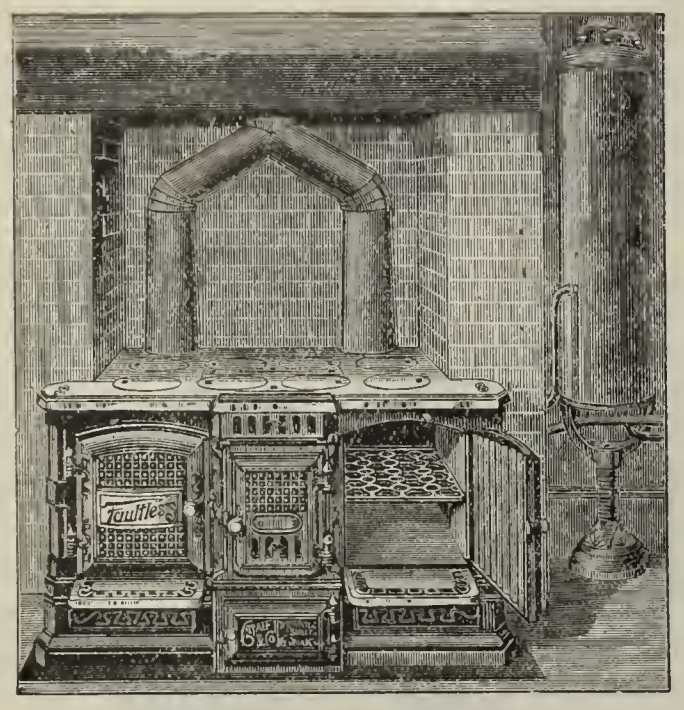
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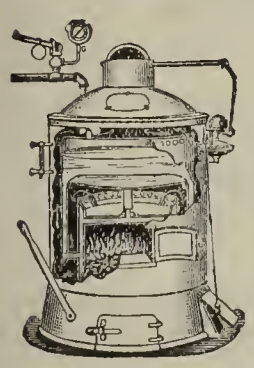
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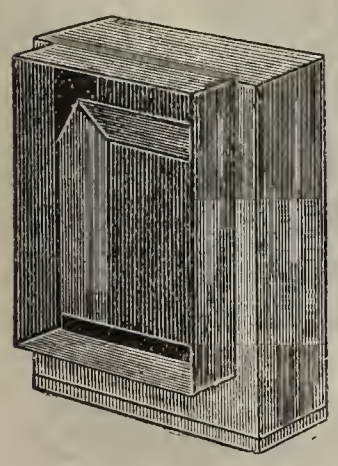
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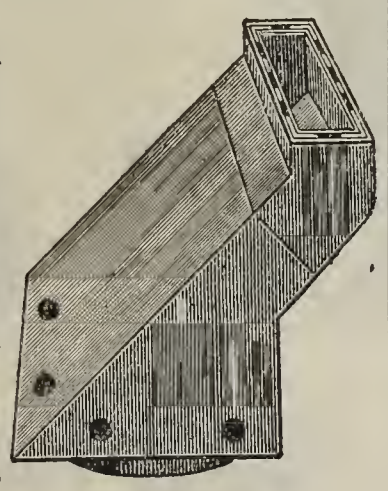


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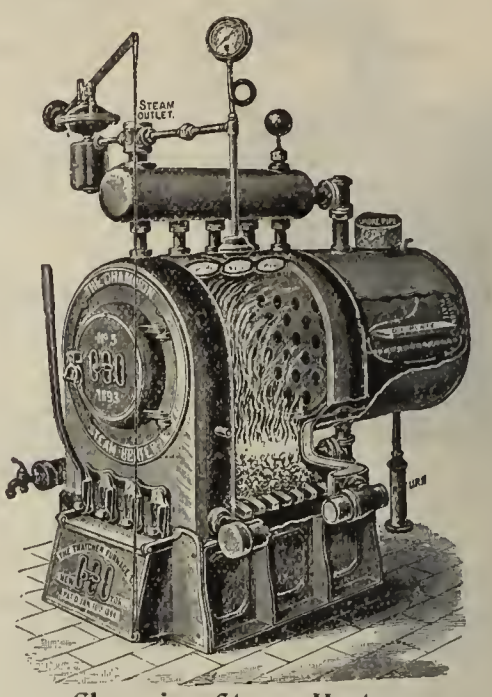
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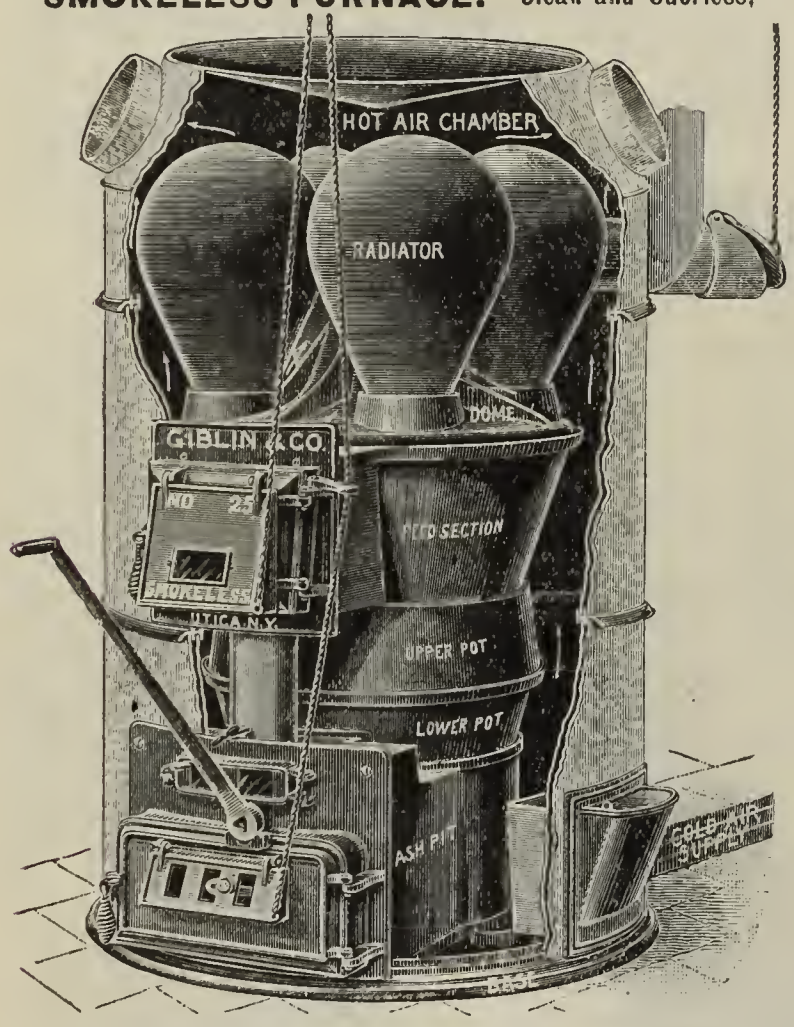


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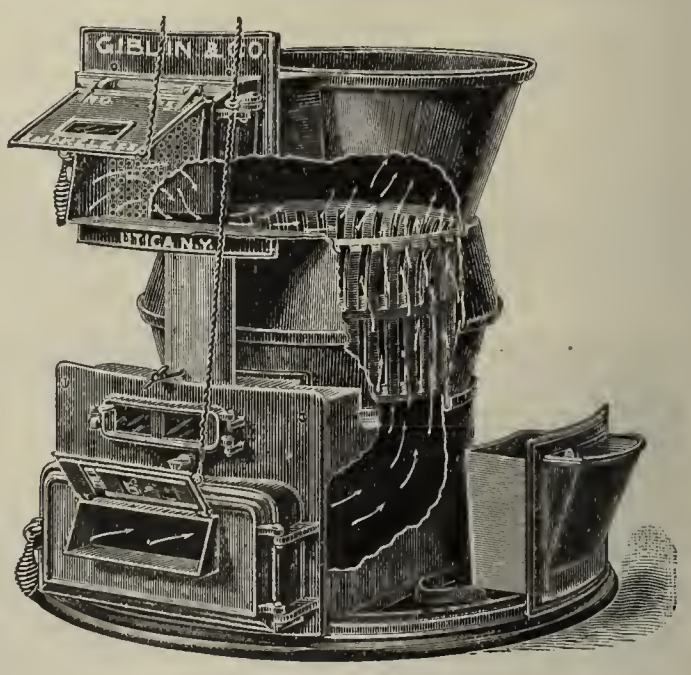
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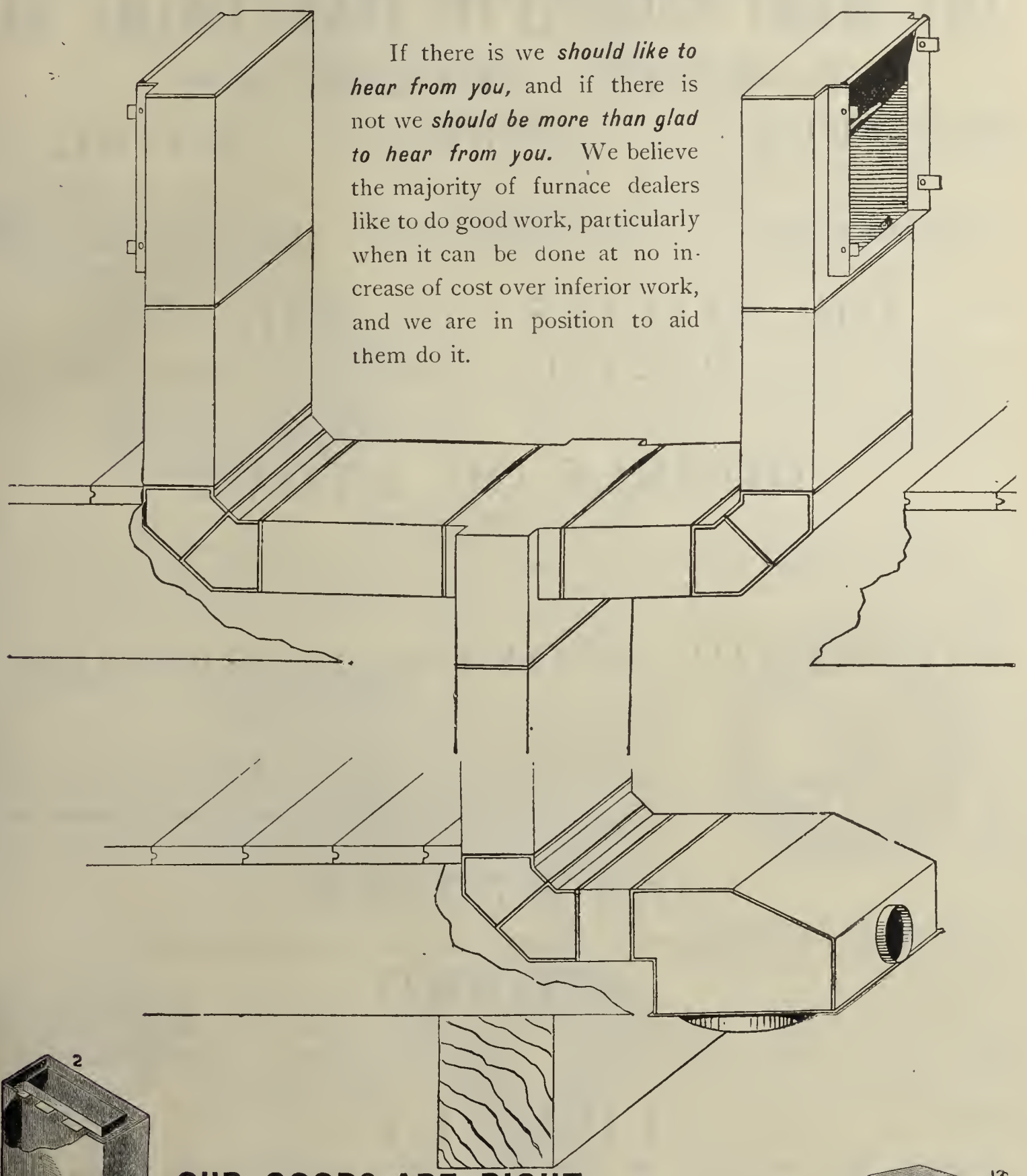
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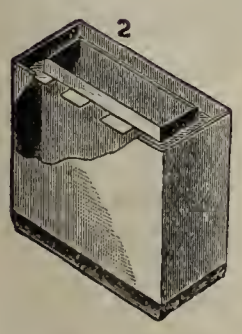
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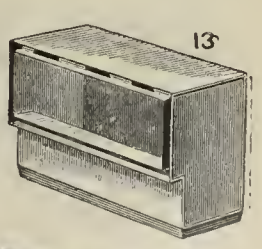
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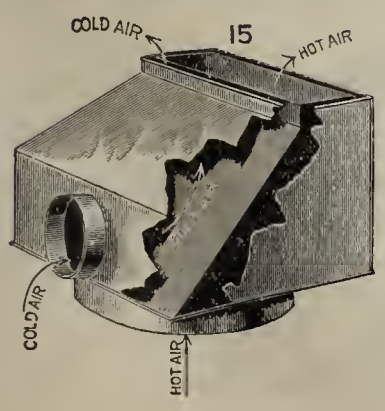
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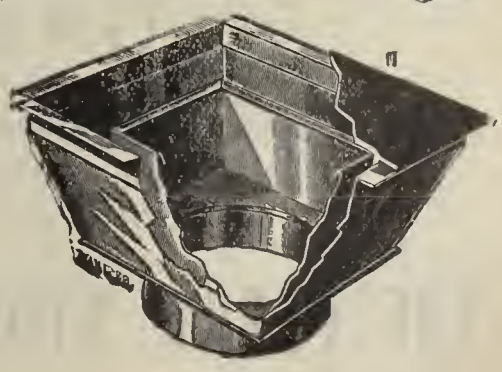
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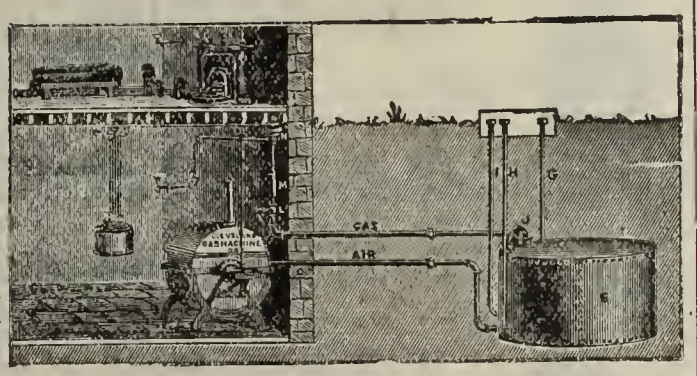
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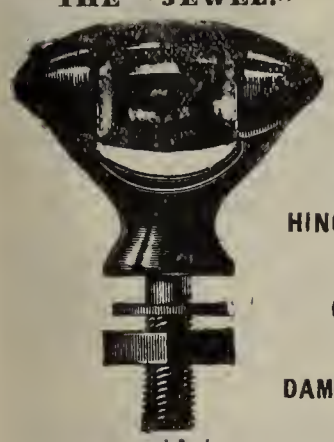




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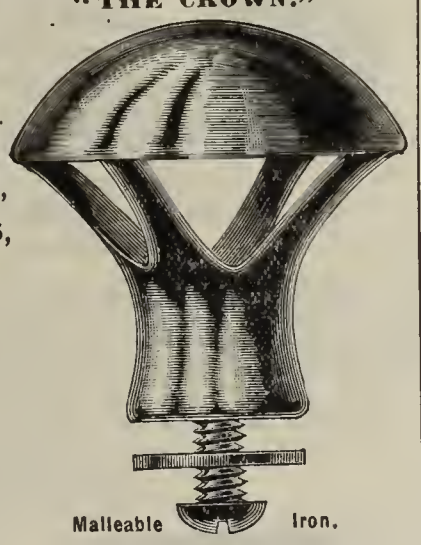
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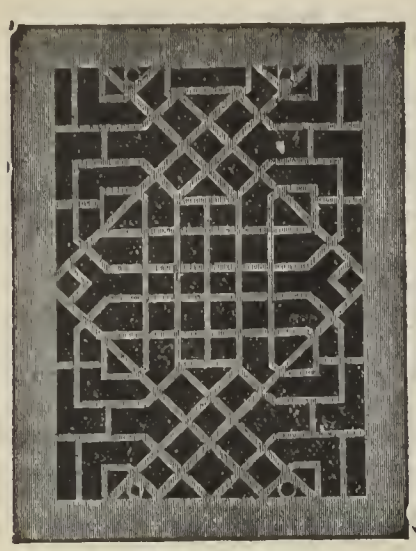
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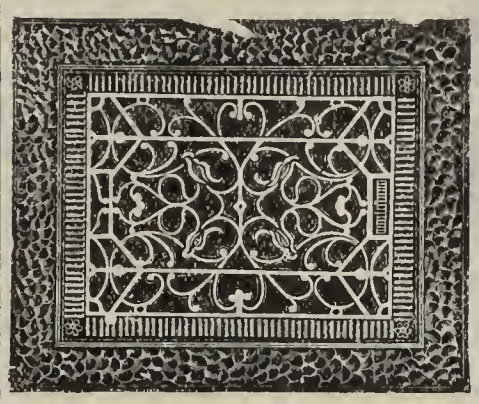
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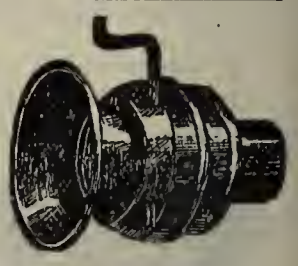
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Stove, Range, Furnace, Heater and Boiler,

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— IT DIDN'T MATTER. — A young woman once said to a friend: "I should like to marry an engineer."

"A civil engineer?" asked her friend.

"Oh, it would not matter much. I would soon make him civil," was the reply.—*Tid-Bits.*

— AN INHUMAN TEST.—Mrs. Crusty (awakening at 2 a.m.): "Is that you, Tom?"

Mr. Crusty: "Yeshm."

Mrs. Crusty: "Well, pronounce the name of the flower you've got on."—*Chicago Record.*

— A NATURAL MISTAKE.—"That was an awful mistake Madge made at the Twiggs reception."

"What was it?"

"She sat and talked for twenty minutes to a cluster of chrysanthemums, thinking it was one of the guests."—*Chicago Inter-Ocean.*



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No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8⅛ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

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B. & B. STOVES ARE ALWAYS AHEAD.

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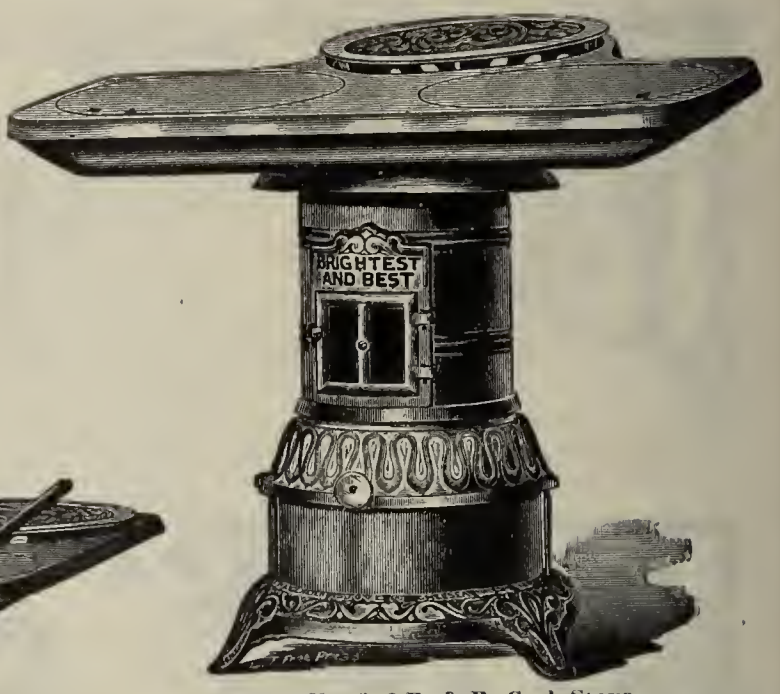
No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozen in box. Weight, 85 pounds. Height, 8⅛ inches. Size of Tank, 5½x5¾. NICKEL FRONT. Two 4-inch wicks.



No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozen. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8⅛ inches. Size of Tank, 5⅛ x 8⅛ inches. NICKEL FRONT. Three 4-inch wicks.



No. 6–3 B. & B. Cook Stove.

Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.



No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**



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Nickel Finish. List Price, $3.50. 7½ inch double thick circular wick.

It will pay you to consider these points.

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, April 14, 1894.

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Tin Plate Production.

Col. Ira Ayer's special report of the production of tin and terne plates in the United States for the quarter ended December 31, 1893, an abstract of which is printed in another column, presents several features of interest in connection with this industry. Although the aggregate output of plates —27,357,241 pounds—was but little over 200,000 pounds in excess of that of the previous quarter, it should be borne in mind that the last quarter of the year was one of unusual depression, bordering on panic to all the industries of the country. In this depression the sheet metal trade took its full share; and that the tin plate manufacturing industry not only held its own during that disastrous quarter, but even exceeded the output of the previous three-monthly period, is cause for congratulation. It is an indication of underlying strength which is quite significant. Had the then condition of things been normal, there is no reason to doubt that the tin plate industry would have shown a remarkable step in advance in the last quarter of 1893. On this account the report must be taken as a satisfactory one.

American Black Plates.

But a further source of satisfaction is shown in the increasing ratio of American black sheets, lighter than 63 pounds per 100 square feet, produced and used for tinning. The rapid development of the production of these sheets is clearly shown in the tables presented. The total output of black plates for tinning purposes, according to the sworn statements of 17 firms, was 19,679,910 pounds, as compared with 11,355,368 pounds in the former quarter. Of this total 90 per cent. belonged to the lighter class, as against a proportion of 72 per cent. in the September period. Then again, out of 39 manufacturing concerns the proportion of firms using entirely the American product has increased to 21, while 12 more use domestic plates in part. The aggregate output of tin and terne plates made from American black sheets, and, therefore, being American plates in the strictest sense of the term, increased in the December quarter to 15,907,669 pounds, against 11,443,572 pounds made from foreign black plate, or about 58.16 per cent. of the whole. These figures are, as we have said, interesting, as showing that even the fear of tariff changes and the universal trade depression of the latter part of last year, were not operative in depressing this industry to any appreciable extent.

Machinery in Sheet Metal Working.

Probably no field of mechanical industry has been more completely transformed in its methods and in its commercial importance by the increasing use of machinery than sheet metal working. In coppersmithing, it is true, old time methods still prevail to a considerable extent, but in the working of sheet iron, tin plate, sheet brass, &c., in which individual parts are joined by seaming, riveting, soldering or brazing, the largest proportion of all the operations is performed by machinery. Even the soldering of a large number of articles now made of tin plate is done by machines. No doubt the reasons why the coppersmith's art has not shared to an equal extent the revolution thus effected in other branches of sheet metal working are partly the fact that the principal industrial uses to which copper lends itself in the unalloyed state do not necessitate the extensive employment of numerous small pieces to be shaped and subsequently joined together, and partly the nature of the metal itself, which distinguishes it from other metals, rendering processes by which they are worked inapplicable to it in greater or less measure.

Cleveland, Ohio, Manual Training School.

The new building which is to accommodate the Central Manual Training School, in Cleveland, Ohio, was recently thrown open for use. Its interior arrangements and general design are after plans prepared by the principal, William C. Skinner, to whose unwearied efforts a large share of the credit for its erection is due. The building is of white sandstone, handsome in appearance and surmounted by a high tower. It is divided into three general subdivisions on the two main floors and in the basement, and a large number of windows afford perfect illumination to the various classrooms. Among the departments on the main entrance floor is that of wood working, which includes a pattern shop containing 25 lathes of latest design. This shop will accommodate 25 boys at one time, and four classes will be taught in a day. The machine shop, equipped with engine lathes, planers, shapers, drillers, milling machines, &c., is on the same floor. The second floor contains the carpenters' shop and drawing room, each of which will hold a class of 25 boys at a time. The smiths' shop occupies one-half of the basement, with a score of modern forges. The other half is given up to the power, heating, lighting and ventilating apparatus. The heating and ventilation are well provided for. A large fan run by a small auxiliary engine draws in the air from outside and through a screen which separates from it the particles of dust. The air is then passed through a system of steam pipes, which heat it to the desired temperature before it is sent through the building.

Evening Educational Classes for Mechanics.

The Young Men's Institute of New York, Y. M. C. A., located at 222 and 224 Bowery, New York, is an institution doing splendid educational work in the line of instruction and assistance, in both general and technical knowledge, to the young mechanics of the city, by means of evening classes. These classes are growing in importance every year. They have been found to fill, in a very satisfactory degree, the educational requirements of a large number of young men employed in various trades, who are anxious to widen their knowledge or supply the deficiencies in their early mental or mechanical training. During the season of 1893-4, just brought to a close, 635 young men have availed themselves of the advantages offered by the institute for a very small fee. These youths have had the choice of 11 different courses of study, which include such valuable practical subjects as freehand, mechanical and architectural drawing, carriage drafting, penmanship, bookkeeping, shorthand and typewriting, arithmetic, steam engineering and electricity, and it is a gratifying circumstance that so many young mechanics have embraced the opportunity. The mental and moral value of such work as is being carried on by the Young Men's Institute is obvious.

The next meeting of the Western Foundrymen's Association will take place on Wednesday, April 18, at 7.30 p.m., in rooms 702-703 Temple Court Building, 225 Dearborn street, Chicago. A paper by Thos. D. West will be read.

THE LETTER BOX.

No Place for Boiler.

From F. H. A., *Lancaster, Pa.*—Will *The Metal Worker* please inform me if I can get a satisfactory circulation with a boiler setting in a basement and connected with a range on the floor above, which would make the top of the boiler below the bottom of the range? I have tried every way to find space for the boiler without putting it in the basement, but it is impossible.

Answer.—There would be danger with the arrangement described, for under heavy firing steam would be sure to form in the water back and probably in sufficient quantity to drive all of the water out of a hot water back, and when, through condensation, water could again enter an explosion through quick generation of steam would be a natural result. The boiler may be suspended horizontally from the ceiling in the room where the range is, with the side opening at the bottom to carry the cold water to the water back and the return to connect with the opening in the bottom of the boiler. The supply may be attached to the opening having the tube as usual, and the hot water outlet should have a pipe to run into the boiler and up near the top, so as to secure the hottest water. A boiler is frequently set in an upper room.

Sheathing for Tin Roofing.

From B. J. P., *New York.*—I intend putting tin on a steep roof, using the standing seams, and a question arises with me whether the tin will rust quicker on the under side if the sheathing is laid about 2 inches apart than it would if matched sheathing is used laid tight. I would like to hear from the roofers on this subject.

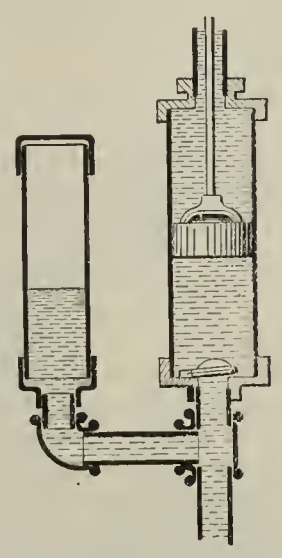
Buoyancy of Air Chambers.

From B. S., *Connecticut.*—I am making air chambers to put in a sail boat which are 10 inches in diameter and 26 inches long, made of galvanized iron of No. 28 gauge. Please inform me what is the buoyancy of these cans—that is, how much will each one hold up in the water?

Answer.—A calculation shows the weight of the cans to be about 5 pounds apiece, or, allowing for the seaming of the metal and the solder, &c., perhaps a little over 5 pounds. The capacity of a can 10 inches in diameter and 26 inches long is 2042 cubic inches. Reducing this to cubic feet and multiplying by 64.08, which is the weight in pounds of a cubic foot of water, we find the weight of a volume of water of the capacity of a can to be 75.7 pounds. Allowing 5.7 pounds for the weight of the can itself gives a buoyancy of 70 pounds each. We have taken no account of the weight of the air, as it would be a very small matter to allow for.

Vacuum Chamber for Drive Well.

From C. S. S., *Litchfield, Minn.*—I send a sketch of a vacuum chamber which I have used with good results in several cases where pumps in drive wells failed to operate properly. Of course the chamber will not make a pump give water where there is none, but it will greatly increase the capacity of any single action pump that is connected with a drive well where there is a supply of water. The chamber will also greatly relieve the pump from the jerk or kick caused by the water not



Vacuum Chamber for Drive Well.

coming up the pipe as fast as the plunger rises in the cylinder. The partial vacuum in the chamber above the water line causes the water to rush through the supply pipe during the upward stroke of the pump handle or downward movement of the plunger. When the handle is forced down and the plunger raised, water is drawn from the chamber as well as from the supply pipe. I have applied this device to pumps in drive wells that worked very hard and gave a limited supply of water. In every instance it overcame the difficulty, and in some cases caused the pump to work as easily as if connected with an open well. I hope this device will be of service to the readers of *The Metal Worker*, and that some of them will give it a trial and report the result.

Strips or Sheet at a Time?

From C. A. W., *Chicago, Ohio.*—I would like to be informed through *The Metal Worker* which makes the best flat seam roof when 20 x 28 tin is used—that laid sheet at a time, or that put on in strips when the strips are from 18 to 26 feet long? What is a "kicker," of which "J. F. S." speaks in *The Metal Worker* of March 31?

Note.—We hope our readers will answer this correspondent on the roofing question. The "kicker" is the name generally applied to roofing seamers made by different manufacturers, and probably comes from the use of the foot in operating them. They are used, in standing seam roof, to turn the higher edge over the lower one, which is done by the hands, while the turn down is closed tight by stamping the foot on a lever.

Lukewarm Water.

From C. D. F., *Berwick, Pa.*—I am called in to arrange a plumbing system, that was erected by another person, so that hot water can be got from it at all times. I inclose herewith a sketch of it. An ordinary range is connected with a 50-gallon boiler, and after it had run for a few days only lukewarm water ran from the faucets. The boiler was connected with the water back with 1-inch pipes. I took these out and put in ¾-inch pipes, and for about eight or ten days a good supply of hot water was secured, when the old trouble was renewed and only lukewarm water could be drawn. I shall be glad to receive any suggestions as to what would overcome this difficulty, for it is the first time I have been stuck in 35 years of practice. There is a good supply or force of water at the top story even when five or six hot water faucets are opened.

Note.—Our correspondent's sketch has not been reproduced, as the method of connecting the boiler showed nothing unusual, and the pipe if run as shown had no defect. We will be glad to have our readers make suggestions as to the cause of the lukewarm water after a supply of hot water has been secured from the system. We think that the changing of the pipe from 1-inch to ¾-inch was a move in the wrong direction, although this would not create the trouble reported. It is possible that the water deposits lime in the pipes and partially closes them, or it might be that the longer the fire is run the more ashes accumulate against the water back and reduce the heating capacity.

Cold Water Comes First.

From W. L. H., *Sudbury, Ont.*—I inclose you a sketch of a job of plumbing which I have done in our town which does not work satisfactorily. The difficulty is hot water cannot be gotten before about a pailful of water is drawn from any of the taps. Three-quarter-inch pipe is used throughout, with the exception of the boiler connections, where 1-inch pipes are used for connecting a 40-gallon boiler with the water back. The hot water pipe is brought up above the supply tank and a check valve put on the end to prevent air entering from the tank and to permit the escape of any air or steam that may arise in the boiler.

Answer.—We have not reproduced our correspondent's sketch, which shows

fixtures on the same floor with the boiler and on two floors above it. It is natural that the water in the pipe between the boiler and the fixtures will become cool if none is drawn off and that when the faucet is opened the cold water in the pipe would have to escape before the hot water comes. This can be overcome by connecting a smaller pipe with the hot water pipe at the highest point and returning it to the boiler and connecting it with the pipe from the boiler to the water back. This will keep up a continual circulation and enable hot water to flow from the faucets as soon as they are opened.

Wants Furnace Suggestions.

From CÆSAR, *Louisville, Ky.*—In the diagram and request from "A Tinner, Montana," in *The Metal Worker* March 24, for suggestions regarding the heating of a church, I notice one omission on his part that is very essential for a person to know before he can intelligently make suggestions: it is the size of the furnace. This church should have a furnace with a 30 to 32 inch fire pot at the least. In regard to the outlet for smoke, "A Tinner" has a very serious difficulty to overcome at the outset in a 10-inch collar and smoke pipe and an 8-inch flue. The smoke pipe has an area of 78 square inches, and the flue has only 64 square inches, making a difference of at least 25 per cent. against him. This, however, can be overcome by constructing a flue box having a 10-inch collar on one end and two 8-inch collars on outlet end. This box should be not less than 18 inches wide and 12 inches deep and 12 to 14 inches long, that is, from collar on furnace to end where both 8 inch pipes connect. Then divide the box by a partition placed perpendicularly so as to throw the two 8-inch collars separate from each other. This partition must continue the full length of box until the end of partition will divide the 10-inch collar on furnace into two equal parts, as shown by sketch. By this construction a workman is enabled to attach from two to four smoke pipes to one flue or *vice versa*. In regard to the registers, it is noticed that the hot air outlet is cramped, being only 685 square inches in area, and the exhaust, as near as can be judged by the size of registers, one 20-inch and two 12-inch, equal 540 square inches in area, making a difference of 145 square inches. In the style of heating adopted in this case the exhaust should equal hot air inlet in area. If I might offer the suggestion I would plant this job as follows: One 48-inch round register over furnace with an area of 900 square inches. I would connect pit under furnace with 18 x 18 registers placed in four corners of church by four 17-inch pipes having a combined area of 907 square inches. This will give a complete circulation in the church. I noticc that all of the exhaust is placed in south end of the church, while the north end, which is the coldest end of building, is left to contend against the natural pressure from the north and west, but also against the unequal circulation inside. I hope that these suggestions will be received in the same spirit in which they are offered.



Wants Furnace Suggestions.

Loss of Steam Pressure.

From J. G., *Philadelphia.*—I think, from reading *The Metal Worker*, April 7, that "H. B. C.," St. Louis, probably has gauge pipe on kettles obstructed. I would suggest that he transpose kettle gauge to steam pipe and steam pipe gauge to kettles and note the result. While kettle gauge is off blow steam through opening where it was. Look into gauge and see that it is not obstructed. When sure that gauges are both right—if result is as now—then he has a leaking pipe underground, or steam traps leak through. If the kettles are very large and the contents cold, probably the ¾-inch supply pipes are too small to maintain pressure above 20 pounds. Possibly the valves have the pressure on top of the disk instead of under it, and the disk drifts upon the valve opening, being loose, and partially closes the same. I have known a loose disk to entirely close a line of steam pipe, and while the valve handle turned the disk did not respond, consequently when the valve was thought to be open it was really closed.

From R. D., *New York.*—In reply to "H. B C.," in *The Metal Worker* of April 7, would suggest that he disconnect the kettle and see if the annular opening between the two shells has not been contracted more than was intended, or the steam pipe may go through so far as to come in contact with the inner shell, thereby contracting the opening. It may be that the valve on the trap has been removed and allows the steam to blow through. The gauges may not be placed in a favorable position. I would take out all the ¾-inch pipe, also the gauge pipe, and ream them out, as the cutters leave large burrs projecting on the inside, which is very serious where the pipe is small.

From REX, *Rochester, N. Y.*—If "H. B. C.," St. Louis, will turn steam on to his kettles when empty, he will find that the pressure on the kettle gauge will stand very near the same as the gauge on the line; by filling the kettles with water he will see how quick the pressure will drop, showing that the steam connections to the kettles are too small.

Fuel for Furnaces.

In a letter from a correspondent in Rochester, N. Y., entitled "Fuel for Furnaces" and published in *The Metal Worker* of April 7, page 36, appeared some misprints which need correction. In the first column, on the twenty-fourth line from the top "250 bushels" should read "520 bushels," and similarly in the thirty-second line. On the fifty-ninth line the price of coal should read $5.25, and in the fourteenth and fifteenth lines from the bottom of that column the phrase "three times longer" should read "three days longer."

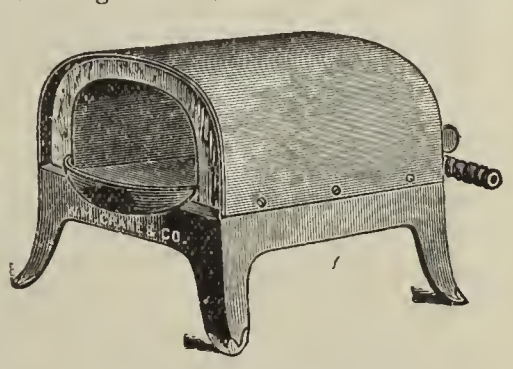
A. B. Sproul, New Haven, Conn., tin and sheet iron worker, has been obliged by increase in business to add to his premises and has taken in 240 Wooster street in addition to 242 Wooster street, where he has been located.

Chicago Builders and Walking Delegates.

The builders and contractors of Chicago have planned a grand *coup* for the discomfiture of the walking delegates who have been giving them so much trouble this spring. It is the cessation of all building operations throughout the city on the 12th inst., to continue until an agreement can be made by the employers and their workmen which will enable work to be prosecuted without the vexatious interference of the walking delegates, who are constantly fomenting trouble in order to magnify their own importance. There is no question of wages involved in this movement, although in some lines there are such disputes pending. These troubles, however, are to be settled by those interests which are directly concerned. The builders, contractors and materialmen have formed an organization styled the Central Building League to carry out their purposes. The action was taken at this time to forestall strikes threatened in several trades which promised to seriously interfere with building operations now becoming unusually heavy. It is deplorable that action of this kind should seem necessary just as workmen are finding employment in large numbers after a most trying winter of scanty work and great privations. The conflict, however, has been brought about by the workmen themselves. It is hoped that a speedy settlement may be made, so that the interruption to work will not be serious. If it should be prolonged it will be a severe shock to business, as so many interests are affected apart from those directly engaged in the unfortunate controversy.

Vulcan Soldering Furnace.

W. M. Crane & Co., 838 Broadway, New York, are marketing the Vulcan soldering furnace, as here illustrated.



Vulcan Soldering Furnace.

It is intended for heating soldering coppers by gas. The burners are located on each side of an opening 7 inches long and 2 inches wide in the floor of the oven, and so arranged that melted solder cannot get into it and clog them. Parallel with the floor of the furnace are a set of cast iron supports on each side, on which a pair of coppers can be placed, keeping them warm when not in actual use. When needed, the copper rests directly over the opening, so that the flame passes over and around the whole copper. The furnaces are made in two sizes, Nos. 1 and 2. No. 1 is 8½ inches long, 5 inches wide and 7 inches high, No. 2 being the same length and hight, but 2 inches wider. These are brick lined, to economize fuel. Nos. 3 and 4 are similar, but not lined. The consumption of gas is put at 12 cubic feet an hour, but can be graduated at the cock if less be required.

Press Working of Sheet Metals.—IV.

BY OBERLIN SMITH.

Cutting Processes.

Having more or less accurately formulated the ideas of writer and reader regarding tools and materials, we will now deal with actual processes, showing in such diagrams as may be necessary only conventional forms for shear blades, dies, &c., and omitting as far as possible, for the sake of simplicity, pictures of the presses themselves or of the methods of fastening dies thereto. The details treated of will generally require only certain views of the working surfaces of the respective dies and of the materials worked therein. The letters U and L will represent upper and lower dies respectively in their conventional sense, although it must be remembered that the respective positions of these are, in practice, sometimes reversed, or in some cases turned at right angles or at some other angle to their usual vertical position—as in horizontal shearing machines, inclined presses, &c. The metal or other material when shown between the dies will usually be represented by dotted lines and will be marked M.

Chiseling.

If we analyze cutting processes as performed in presses we find a most primitive idea to be that of the chisel, as shown in Fig. 84. This is in a certain sense a form of coining or forcing the tool bodily into the metal. Practically it is an application of the wedge, which was probably carried out in antediluvian times, when the primeval metalworker found a particularly sharp edged stone and pressed it hard down upon his piece of copper or lead that he might separate it and make the one twain. In modern practice this principle is carried out in the blacksmith's chisel, in the tinman's punch, in various sharp edged dies for cutting shoe soles or other articles of leather, paper, &c., and in that form of foot or power press known as a "sprue cutter," which is usually made with two chisels meeting each other, as in Fig. 85, or more often with one sided chisels, as in Fig. 86, these leaving less of a lump upon the casting *s* when the sprue *c* is removed.

In all chiseling processes there is, of course, a tendency to raise a burr upon each side of the knife, as shown by the dotted lines in M.

Shearing.

The next and most usual process for cutting materials embodies the principle of shearing, shown in its most primitive form in Fig. 87, where a certain part of the material is pushed away from a plane represented by one of its surfaces, as *a a*, Fig. 87, into another plane parallel thereto, by being slid past the other part of the material, which remains in its normal position. This sliding of certain particles or molecules of metal past certain other ones constitutes the stress known in engineering by the general term of "shear," and is governed by well-known laws as to the resistance of the material itself. These laws it is not necessary now to define or formulate further than the reference which will be found near the end of this chapter to the pressures required for such shearing.

In Fig. 88 is shown, in end view, a more usual form of shear blades, the cutting edges being made at an angle of about 75° between their two limiting surfaces, instead of 90° as in Fig. 87. In Fig. 89 is shown the same blades as they often appear after practical use, with their edges rounded off and their adjustment altered so that their vertical faces do not touch one another. In Fig. 90 is shown the appearance of a bar of metal as sheared apart at *s* with the dull blades just mentioned. In the left hand piece the lower corner is rounded, while the upper corner runs up into a sharp burr that has crept up between the blades. Just to the left is an indentation caused by the compressive action of the blade itself. The other piece of metal is, of course, the same but reversed in position.

In Fig. 91 is shown in vertical cross section a piece of sheared sheet metal with the same rounded corner and the same burr at the top, but with a cleaner cut, as made by sharper and well set blades. The burr and round corner are exaggerated, but they are usually present in some degree in all kinds of shearing and punching work. They must be allowed for even in working thin metals with sharp dies, as it is often a matter of consequence on which side of the work this slight burr shall appear and which side shall have a slightly rounded corner.

In Fig. 92 is shown a face view of the blades in Fig. 88, the same being made parallel, so that all points along their cutting edges will come into contact with the metal at the same time. This form is best where the metal must not be twisted or otherwise disturbed, and is good enough in any case where it is quite narrow in comparison with its thickness, as with square bars. With such proportions it obviously is not practicable to much lessen the pressure required to do the cutting by dividing it up and extending it over a longer time. Such an extension of time and lessening of the pressure at any particular moment may sometimes be obtained, however, by making one of the blades, like the upper blade in Fig. 93, with an inclination of the edge, commonly known as "shear." This evidently is useful only where the width of metal cut is considerable. It is obvious that in such case one edge of the piece of bar or sheet metal is pushed down by the upper blade and depressed in advance of the other edge, thus producing a bending action across the sheet which distorts it more or less from its original flat condition as at M. This action is seen in the curling up and twisting of a narrow strip cut from a piece of paper with a pair of scissors, or a sheet of tin plate with a pair of snip shears. In many cases it does no harm, and we therefore see the great majority of shearing machinery made in this way. This inclination of one blade to the other is usually somewhere between 2° and 10°. If the angle is too great the tendency of the work is, obviously, to slide lengthwise of the blades, or toward the left in Fig. 93. The greater the angle the easier the work is done by the machine and the more the sheet is distorted, and *vice versa*.

It is very desirable that the word "shear," as designating the angle of inclination referred to and also the act of mechanically producing such inclination, should be changed for a less confusing term, as this word is already used in many cases for the press itself which does the shearing and for each of the blades which are mounted thereupon, and for the act of doing the cutting work itself. Thus in this connection we may easily have such an awkward and misleading sentence as the following:

"Tom, shear half an inch the upper shear in the two-ton shear, that it may shear more easily by having more shear—and, I say, Tom, leave a sheer opening of an inch and a half."

The above sentence reads like sheer nonsense. It is, of course, given as an extreme case of the evil referred to, but I have heard orders uttered which were nearly as confusing. The word in question is above used the first time as a verb, denoting the act of grinding more inclination upon one of the blades; the second time as a noun, meaning the blade itself; the third time as a noun, meaning the machine in which the blades are mounted; the fourth time as a verb, denoting the act by the machine of shearing the material worked upon; the fifth time as a noun, designating a detail of construction of the blades, and the sixth time (differently spelled) as an adjective, defining the space between said blades. In my own practice I am endeavoring to use the term "dip" as a substitute for "shear" in this connection, but I probably may not succeed in inducing the public to accept it. This word is given by Webster as a synonym for slope and pitch and has in its favor brevity and crispness, together with no danger of confusion with other terms apt to be used in the same connection. It also is correct from an engineering point of view (at any rate in the case of ordinary upright shearing presses) as representing some angle of inclination with the horizon, and it is already applied to such angles in mining parlance when speaking of mineral veins. It would also seem somewhat appropriate in speaking of gangs and punches as shown in Fig. 97, which are set with their lower ends in a series of different hights, that they may not enter the work all at once and thus bring the pressure required for each cumulatively upon the press. In this case certain of the punches have a dip, so to speak, below the other ones, in the sense of reaching downward. A word often used in connection with such punches is lead, meaning that one has the lead of some other one in first striking the work. To tools of this kind the word "shear" is hardly applicable at all, but the word "dip," if it could be generally introduced, would answer for all cases of punches as well as shear blades.

Punching.

In Fig. 94 is shown in vertical axial section (which, by the way, is the kind of view given in most of the previous pictures where circular work has been represented, and which will be usually understood hereafter unless otherwise specified) a pair of ordinary round cutting dies, without dip, both working surfaces lying in planes parallel to each other. It is evident that such a pair of dies are in principle simply a pair of shear blades, like Fig. 92, bent around into a circle, and that the same principles involved in ordinary shearing hold good. This statement may be somewhat modified where the diameter of the blank (this term "blank" meaning in general any shaped flat piece cut from a sheet) is quite small in comparison with its thickness, as for instance in

[*Correction.*—In the article on "Press Working of Sheet Metals" in *The Metal Worker* of March 17, page 45, Figs. 76 and 77 were transposed, the latter being intended to represent the end of a flat bar of metal and the former a sheet of tin plate. Upon page 47, in the thirty-first line from the top of the first column, Fig. 82 should read Fig. 81.]

punching boiler plate, &c. In such cases a little more force must be required to do the shearing, on account of the blank being tightly confined in the hole from which it is pushed; while in doing the same amount of shearing in a straight line the piece cut off usually falls freely away without friction.

In Fig. 95 is shown an upper die or punch, such as is often used for boiler work, &c., with its lower end made in a spiral form, instead of lying in a plane normal to its axis. Various experiments with such punches have shown them to require considerably less force to drive them through than in the case of the ordinary flat bottomed ones.

about the vertical axis of the ram. Of course this cannot always be done, and in such cases a more rigid press will be required than in the other case. The lower die L in Fig. 96 is also shown dipped, having in this case four high points. In practice, however, one die is usually made flat, all of the dip being put upon the other. Which die should be flat depends upon the nature of the work. With a thin material, such as tin plate, and with diameters, say, not over 2 inches, this point is of little consequence, as both the blank and the sheet outside of it, if sprung out of flat while the die is going through, will readily be restored to a flat condition

In general, it is better theoretically to have only two high points upon cutting dies, either round or otherwise, as the metal which is sprung out of flat by reason of the dip is, in such case, simply bent into an approximately cylindrical shape, while with more than two points it is distorted in more than one direction into a dished shape or otherwise, which may permanently warp it beyond power of recovery, because certain parts of the metal are then actually stretched while others remain normal. This can be vividly demonstrated by merely bending a thick sheet of writing paper, which does not hurt it, and then by pushing it a little way into one's hat,

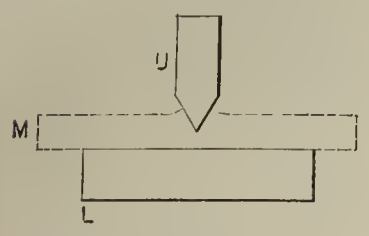


Fig. 84.

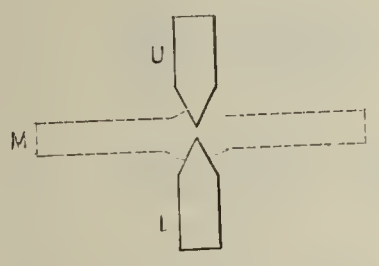


Fig. 85.

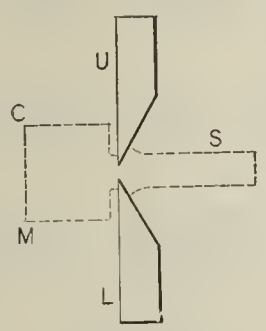


Fig. 86.

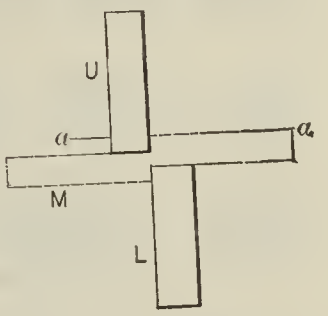


Fig. 87.



Fig. 88

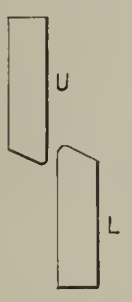


Fig. 89.

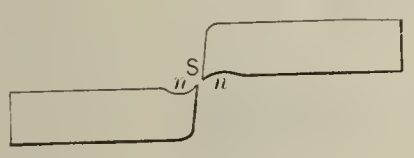
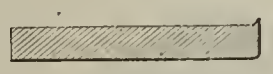


Fig. 90.


Fig. 91.

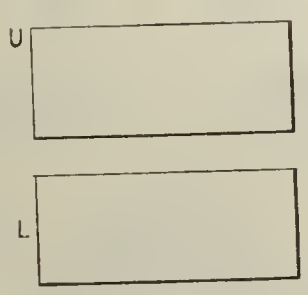


Fig 92.

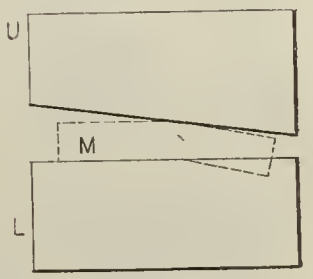


Fig. 93

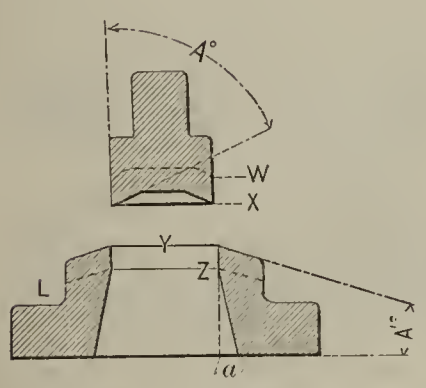


Fig. 94.

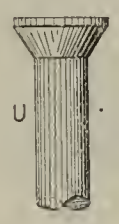


Fig. 95.

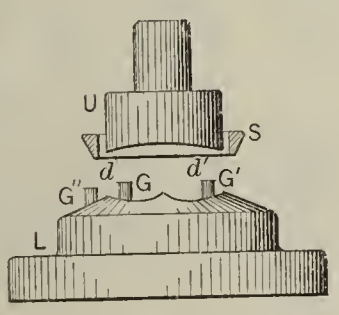


Fig. 96

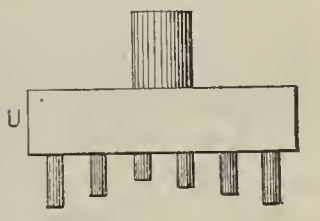


Fig. 97.

PRESS WORKING OF SHEET METALS.

In Fig. 96 the same principle of dip is shown in the upper die U with its two high points *d d'*. These strike the metal first, the bottom of this die being scooped out in general as if it had been held against a cylindrical grindstone. For large diameters this is much better than a single high point, as in Fig. 95, because the pressure upon the press ram is balanced, whereas with one point striking the metal first there is a tipping action which tends to spring the ram and upper part of the press frame out of a vertical position, and consequently to slide the upper die sidewise over the lower one. Such action often occurs in practice, to the considerable detriment of the cutting edges, and great care should always be taken, where a die is over 2 or 3 inches in diameter at any rate, to see that it strikes the metal at two or more points equally balanced by their own elasticity. If, however, the metal is thick and rather non-elastic and the diameter small, it is evident that an upper die scooped out, as in Fig. 96, would bend the blank, perhaps beyond its elastic limit. In such cases, therefore, the upper die should be perfectly flat, that is, if no damage will be done to the sheet outside by its being bent as it rests on the dipped lower die. Usually in such cases this sheet outside is only scrap, and such bending will make no difference. If, however, it too must remain flat, the only recourse is to make both dies without dip and use more pressure to drive them. In cases where mere perforating is done—that is, where the sheet outside the blank is the article required for use and the blank is regarded as scrap—the upper die should always be the dipped one.

which ruins it. Practically, with thin metals this action may be neglected, and it is often best to put a high point at each angle of the contour line of blank, as *e. g.*, three in a triangular die, four in a square one, &c. These points entering the other die first serve to guide their relative motion during the rest of the stroke and thus to protect such parts of the cutting edges as follow after in their contact.

In Fig. 98 is shown a part of the frame of a press with a pair of plain shear blades mounted directly upon bed and ram. In Fig. 99 is a similar view, with shear blades made for cutting off round iron, there being a series of semicircular notches in each blade adapted to the sizes of iron to be worked. Upon this view there is also shown an adjustable gauge, G, such as is often used for pushing a bar against,

to regulate the length of the piece cut off. In Fig. 100 is a similar view of a deep throated press frame, with a small round punch and die mounted in chucks set therein, and supplied with an adjustable stripper, S. It may be here remarked that the word "punch" is very generally used to designate an upper die, whether cutting, forming, drawing or otherwise, but this practice is not universal. In many cases "upper die" is the better term—for one reason, because the word "punch" is also used as a verb to denote the operation and as a noun to designate the press itself, which is often called a "punch," especially if used for small holes in thick metals. The three views just given are copied from various machines commercially in the market, but are not given as of idcally the best design.

Blanks.

In Figs. 101 to 133, 135 to 150 and 155 to 160, all inclusive, are shown top views of various blanks, each of which has been cut from the sheet at one stroke of an ordinary pair of cutting dies. They are mostly of such shapes as are produced in ordinary tinware factories and consist chiefly of parts of pots, kettles and pans, &c. Figs. 151 to 154 have been merely sheared apart from a rectangular sheet by a gang of curved shear blades, thus producing at one blow the necessary pieces for a stove pipe elbow. Such work as Figs. 134 and 161 are perforated in gang dies, where a number of punches are set in an upper plate, as shown in Fig. 97, and where the lower die usually, but not always, consists of a single plate of steel containing proper holes for the punches to enter.

Gang Punching.

Fig. 162 illustrates a system of gang punching used for producing washers like Fig. 164 and other perforated articles. A pair of dies for such work are shown in Fig. 165, where the metal M, being fed in the direction of the arrow, is advanced to the point *a* at first stroke of the press so that the punch *u* will perforate it and drop through the punching or blank M′ (or Fig. 163). It is then advanced to the point *b* so that at the second stroke the punch *u′* will make the large hole around the small one. The pintle P, projecting below the same and set centrally therewith, enters the small hole and serves to guide the metal more accurately than would otherwise be done by ordinary gauging, so that a completed washer M″ (or Fig. 164) drops through the lower die L. At the same time the punch *u* is punching a second hole and dropping through another blank M′, which again is advanced at the next stroke to have another washer punched from around it, &c. Thus is produced a complete piece of work at each stroke, except the first and last at the respective ends of the bar or sheet. This method can of course be amplified so as to punch any number of holes, of any shape, and in any relative position, at the first stroke, and then, at subsequent strokes, to punch around each one separately or around or between any of them or any groups of them that may be desired. In this way are cheaply produced many small articles such as keys, parts of locks, &c.

Combination Cutting Dies.

Another general method of producing completed pieces at a single operation is by combination cutting dies, wherein one or more male dies are usually set inside of a female die, and *vice versa*. The sexual terms just used have not been before mentioned herein, but are generally understood as designating respectively any punch, such as U, Fig. 94—the male—which enters a die, and any die, such as L—the female—which is entered by a punch. This nomenclature applies not only to cutting dies, but also to those for forming, drawing, &c.

In Fig. 166 is shown a typical form of combination die of the kind referred to, which will produce any perforated work like Figs. 134, 161 or 164. As shown, it is arranged for cutting simply a circular ring or washer, M. Such ring, of course, remains upon top of the lower die L, the small blank cut from it dropping through as usual. An inspection of the picture will show that L consists of a male die at the outside and a female die in the center, while U consists of a female die outside and a male die in the center. The rings K K′ are used as knockouts or strippers and are usually driven by springs, the function of K being to drive the finished ring out of the upper die and of K′ to lift the surrounding remainder of the sheet from the lower die. The work is, of course, shoved out sidewise or backward, either by means of the sheet itself or by means of gravity, when the press happens to be in an inclined position. Such dies as these are largely used for cutting armature disks and such like accurate work, oftentimes being built with a large number of teeth or notches around the outer edge, which obviously makes them very expensive. They are, however, usually built up in sections, so that if one piece needs repairing or renewing the whole die need not be thrown away. Sometimes dies of the kind just described are turned upside down from the position shown. The objection to this, however, is that the blanks from the perforations have to be driven upward through a hole or tube which usually curves over and delivers them at one side of the upper die, or of the ram, should they be pushed so far up.

Recurring to ordinary gang punching dies for producing work, or rather scrap, of the general character shown in Figs. 161, 167 and 169, it is evident that in some cases the holes might be so near together that the little isthmuses, as we may call them, *i*, *i*, *i*, &c., would be too narrow (so as to avoid waste of metal) in the female die to secure the requisite strength for it to hold together. The remedy in such case is to so set the gang of punches and corresponding holes in the lower die that certain alternating holes may be punched in the metal, omitting the ones between, as for instance in Fig. 167, where those marked A are thus punched first. This diagram represents a sheet of tin plate from which six fruit can tops have been made in gang combination dies. The lower die is shown in top view in Fig. 168. After the first stroke the sheet is either turned around or turned over so that at the second stroke all those holes marked B will be punched, and so on. In feeding a long strip of metal by this system (see Fig. 169) there is no lost time except at the ends of the strip, where, for instance, in the case shown, only two holes, A A, could be punched at the first stroke, two whole ones and three halves, B B, &c., at the second stroke, but the five complete ones, C C, &c., as located in the lower die, Fig. 170, at the third and subsequent strokes.

A great deal of work is done upon this system in brass factories and other places producing small articles from long rolls of metal, the feeding usually being automatic. I am informed that this principle of interspacing dies has recently become the subject of a patent which, of course, is an absurdity, as the system is very old.

Cutting Dies.

In general, some of the important points desirable to secure in cutting dies are first rate material of proper hardness; great rigidity against distortion by springiness, especially in lateral directions, and durability by having ample length of bearing surfaces, as from *w* to *x* and *y* to *z*, in Fig. 94. Each die between these points should be perfectly parallel, so that when sharpened by grinding off the top surface of L and the bottom surface of U they will still fit each other as tightly as at first, or as nearly so as is consistent with what their cylindrical or prismatic surfaces, as the case may be, which slide against each other, have actually worn away. It is, therefore, very bad practice to make the hole in a round lower die conical all the way through and to make the upper die conical, decreasing from the bottom upward. Such dies will work well at first, but have very little life, whereas if made as in Fig. 94 they can be ground away gradually (upon their horizontal surfaces) to the points *w* and *z*. Below *z* it is necessary to have the size of the hole somewhat increased to give clearance to the blank, that it may not clog therein. Sometimes this is made conical, as shown, and sometimes it is enlarged bodily and left parallel, with a small step at *z*. It is well, however, to have this clearance quite small. On ordinary dies about 2 inches thick the writer has found it good practice to make the clearance distance *a* from $\frac{1}{32}$ to $\frac{1}{16}$ inch. In the upper die there is no need of giving any clearance, and some die makers even go so far as to make U slightly larger at the top, so that as the lower surface is ground off the bottom diameter is slightly increased, thus maintaining a tighter fit in the lower die than would otherwise be the case. It is generally easier, however, to make the sides parallel all the way up.

Hardness of Dies.

While in the case of punching and shearing thick metals the upper and lower dies or shear blades, as the case may be, are both made hard, there is a large variety of work where one of the dies is made moderately soft, the other one being as hard as possible consistently with not having the sharp edges crack off in working. Such dies can usually be worked upon all metals no harder than iron or very mild steel which are less than $\frac{1}{16}$ inch thick. The object is that the dies may be quickly and cheaply repaired, as far as maintaining sharp cutting edges is concerned, by hammering up the top or bottom surface, as the case may be, of the soft die, thus spreading out or riveting such die sidewise, making it larger if it be the male and smaller if it be the female. This can often be done without unsetting either of them from the press. After the proper amount of hammering the dies are oiled and forced together, the hard one shaving or broaching off the surplus metal from the soft one, thus leaving them again a good fit, one within the other. It is, of course, necessary that the hard die should in such case have a reasonably sharp edge. In most cases it is best to have it freshly ground.

The vexed question of which die shall be hard, male or female, is not of very much consequence, although many peo-

ple take it for granted that it should be the female, simply because they have always been accustomed to that method. One good reason exists for this, however, viz., the presence of a hard surface, which will not wear away so fast, over which to slide the sheets, these sometimes being covered with scale, and therefore doing a good deal of grinding on their own account. In some cases, however, where great accuracy of shape and size is required it is difficult to make the female die hard, because of the trouble of grinding it out to exact dimensions after hardening, ordinary grinding machinery not being made for sliding through small holes of irregular shapes. If, on the other hand, the male die is hard it usually can be ground exactly as wanted, because such grinding is on the outside where accessible. The reason for such after grinding being necessary is, of course, the warping or shrinking, or both, of the steel, which often happens after hardening to an extent great enough to spoil the accuracy with which the die was originally made. The difficulty of grinding above spoken of obviously does not occur with round and elliptical dies, as the female ones can be ground out inside in ordinary grinding lathes.

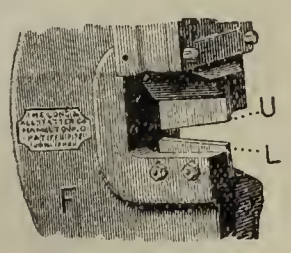


Fig. 98.

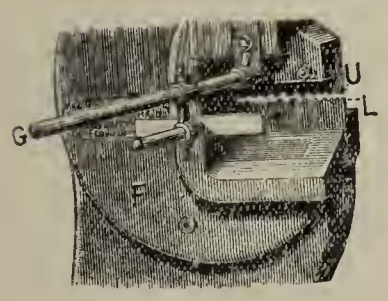


Fig. 99.

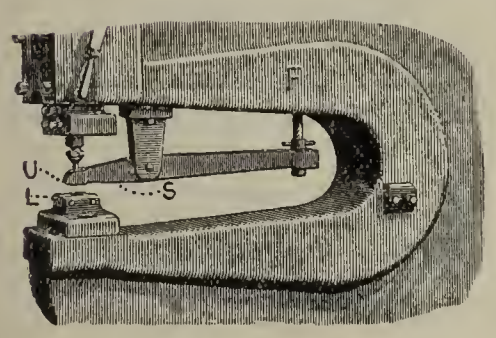


Fig. 100.



Figs. 101 *to* 164 *Inclusive.*

Bevels of Shear Blades.

The bevel of shear blades has been already referred to as being usually about 75°. This angle of course appears in cutting dies, as A and A′, Fig. 94. Its object is chiefly to facilitate the grinding and hammering up practiced in repairs, although it is supposed that the metal is cut easier, with a little less power, than when the edges are at an angle of 90°, as in Fig. 87. Just how much power is saved thereby I have at present no accurate data regarding. In some cases, however, it is better to make the surface of dies perfectly flat, with a 90° angle, to avoid the little notch that is left in the work, as shown at *n n*, Fig. 90.

Strippers.

It is usually necessary to supply a male cutting die with a stripper, which in general consists of a stationary ring surrounding it and extending slightly below it when in upper position, as shown at S, Fig. 96. This is usually secured either to the press frame back of the ram or to the lower die or bolster, it being bent downwardly in such case to meet the place of fastening. The latter method serves a good purpose where the downwardly extending portion is not in the way of the sheet, as for instance where the sheets are narrow. If, however, it is desirable to move the sheet back a considerable distance, as for cutting another row of holes forward of the first row, &c., a stripper is apt to be in the way if mounted as last mentioned. Sometimes a stripper is a ring sliding upon the male die and driven down by springs abutting thereagainst. In still other cases it slides in this way, but is struck upon the up stroke by stationary abutments fastened to the press frame.

Gauges.

In regard to gauges, they are too numerous in design to be described in detail here. In their simplest form they are simply round pins, projecting from the upper die, as at G G′, Fig. 96, for back gauges and G″ for an end gauge, so called. Sometimes, however, gauges are so arranged as to confine a strip of metal at both front and back, and in many cases the end gauge G is arranged as a finger gauge, so that it will move up and down automatically by the action of the press at the proper time. When the feeding and gauging is done by hand, however, the work is lifted so as to slide over the top of G″.

Speed of Dies.

In regard to the best speed for running cutting dies, but little has been accurately determined. The ordinary quick running presses in common use, making from 50 to 150 strokes per minute and generally averaging perhaps 100, seem to work well for shearing and punching most of the common metals which are not over ¼ inch thick. An exception, however, should be made for cast steel, for cutting which a press should be geared so as to run very much

slower than for mild steel, iron, brass and the softer metals. The reason for this is simply to get more durability in the dies, as the edges seem to get dull very rapidly at quick speeds. For punching metals over ¼ inch thick it is usually better to use what is known as a geared press, which generally makes from 25 to 75 strokes per minute. In the cases mentioned presses of short stroke, usually 2 inches or less, are referred to. Where a press happens to have a much longer stroke, it is of course necessary to run at a lower number of strokes per minute to secure the same actual cutting speed.

Pressures.

In regard to pressure required for shearing and punching, it may be said in general that the actual force required to shear a given unit of section is slightly less than that required to pull apart the same section by stretching—that is to say, in most of the ordinary ductile metals, such as steel, iron, brass, copper, &c. In other words, the ultimate shearing strength of these metals is a little less than their ultimate tensile strength, sometimes (as observed with certain steels) being only about 75 per cent. thereof.

This is assuming sharp cutting edges, however, which are not always present. Considering the fact that such dies are often dull, a safe general rule in providing a press for doing certain shearing or punching work would be to have it capable of safely exerting and resisting a force powerful enough to tear apart 1 square inch of section of the particular metal to be used for each square inch which is required to be sheared. In the case of mild steel this may be considered roughly as about 60,000 pounds per square inch; with wrought iron 50,000 pounds, and with other metals less, but always in the same way, according to their tensile strength, which may generally be found in any engineering reference book—that is to say, in cases where the author of the book has taken the trouble to mention the particular metal which the reader happens to want, which is not always.

To give an example: Supposing a press user wishes to shear off bars of iron 1 inch square, or bars 2 inches by ½ inch, or 4 inches by ¼ inch, or to punch a hole 1 inch in diameter (which is about 3 inches round) in iron ⅓ inch thick, or 2 inches diameter in a sheet ⅙ inch thick, or 12 inches diameter in a sheet $\frac{1}{36}$ inch thick. In any of these cases he will wish to cut an actual section of about 1 inch square. He will, therefore, need to use a machine which will give 50,000 pounds pressure at the beginning of the cutting operation, or, more accurately speaking, a little after its beginning, when some slight crush-

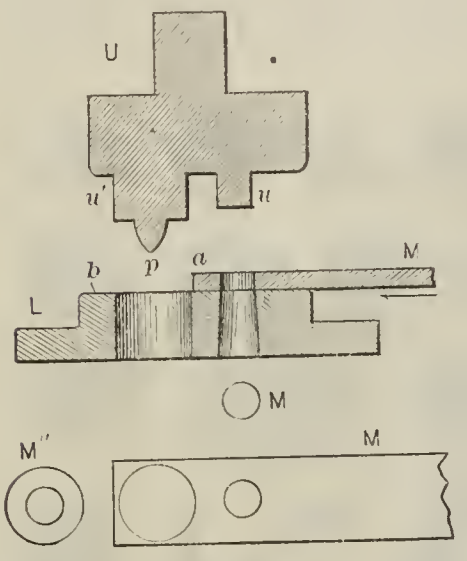


Fig. 165

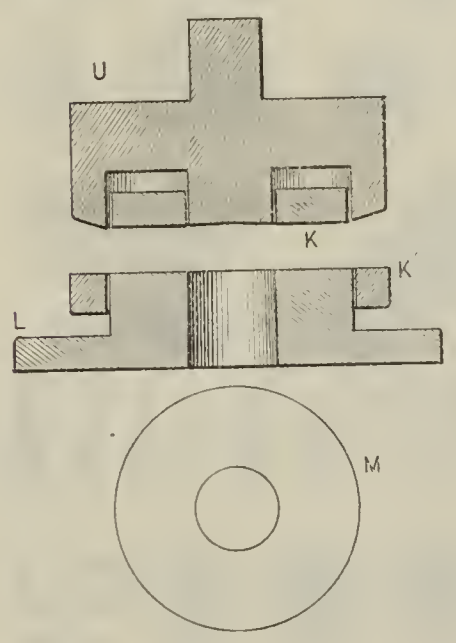


Fig. 166

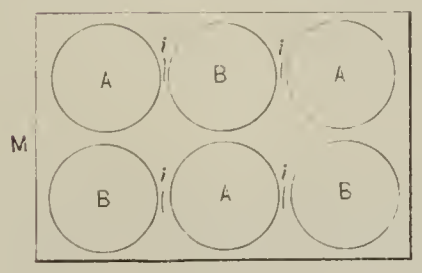


Fig. 167.

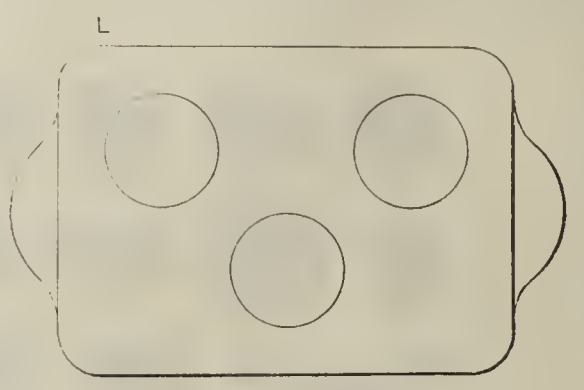


Fig. 168.

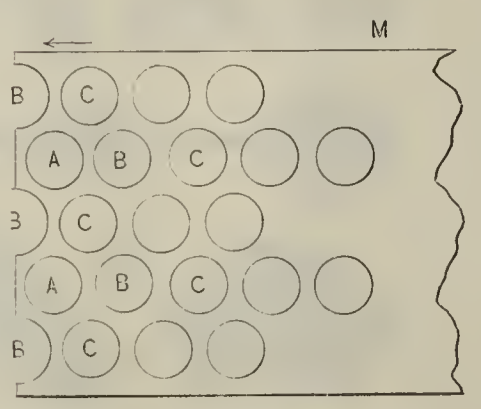


Fig. 169.

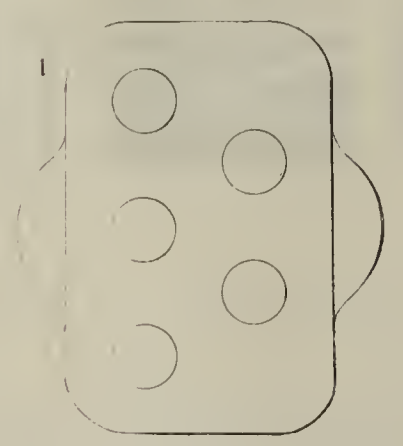


Fig. 170.

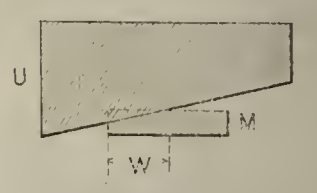


Fig. 171.

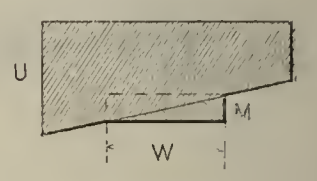


Fig. 172.

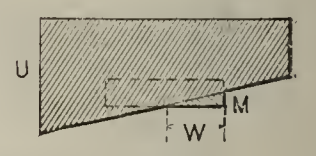


Fig. 173.

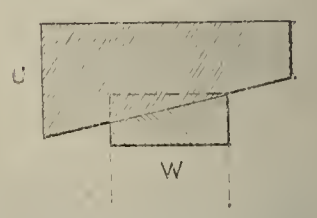


Fig. 174.

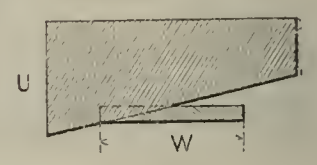


Fig. 175.

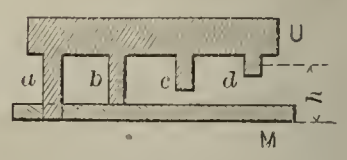


Fig. 176

PRESS WORKING OF SHEET METALS.

ing of the metal has taken place. This initial pressure, for instance in the case of cutting off a bar 1 inch square, will not have to be maintained during the whole 1 inch of ram descent while the cutting is going on. This is because the resistance will soon begin to decrease, probably after the first $\frac{3}{8}$ inch or $\frac{1}{2}$ inch of descending, ceasing entirely after about $\frac{3}{4}$ inch of motion, as at this time the bar will have been so disintegrated as to fall apart before being pushed entirely down to the amount of its own thickness.

The maximum pressure necessary, therefore, for shearing proper is measured by the amount of cross section to be cut, and may be formulated thus: Taking P=pressure in pounds required from ram, W=width and T=thickness in inches of bar to be sheared off, and S=shearing strength per square inch in pounds of the material of the bar, we have: WT=area of section cut and SWT=total initial pressure.

Hence P=SWT, that is, providing there is no dip to the blades.

Applying this rule to punching, we let W=circumference, or length of contour line, of the hole, which is really the width to be sheared. For round holes, taking D=diameter in inches, we have W=Dπ (or 3.14 times D). For square holes, taking D′=short diameter, we have W=4D′. As before stated, a rule easily remembered and one that is on the safe side is to let S=50,000 for iron and tin plate.

The rule just given must, of course, be modified in favor of less pressure requirement wherever it is practicable to use dip upon one of the blades or dies. Figs. 171, 172 and 173 show successive stages of the descent of an upper blade, U, upon a bar of metal, M. In the first position it will be seen that the practical width of cut W is only about one-half that of the bar, while in the second it has become equal to the whole width of bar, and this is evidently the maximum width upon which it will act. The average thickness, however, in this position is but one-half that of the bar, and the area of metal yet to be cut is measured by the triangle just below the blade, which is evidently but one-half the area of the bar's cross section. In the last position the width of cut has been reduced. From these diagrams it will be seen that a blade that has as much dip as that shown will require only about one-half the pressure required by a blade without dip, and this is nearly correct, except that some excess would be required to bend and twist the bar, as in Fig. 93. In Fig. 174 is shown a bar twice as thick as before, and it is here evident that when the width of cut has reached that of the bar itself there remains about three-quarters of the area yet to be cut. Consequently the pressure is reduced by the dip something less than one-quarter only. In Fig. 175 is shown the opposite extreme, where only about one-half the width of the bar and one-half the thickness are at the same time being contributed as factors to the area being sheared. Consequently the pressure required is only a little more than one quarter of what it would be with a dipless blade. In Fig. 176 is shown a gang of punches, *a*, *b*, *c*, *d*, *a* having just reached through the bar of metal M when *b* is ready to commence. In the same way *b* will reach through when *c* commences, &c. Thus it is obvious that the pressure required at any time is only that due to the resistance of one punch, but that the whole hight traveled by the ram while doing its work is represented by *h*, which is four times the thickness of M, or, in general, as many times its thickness as there are punches, providing they are set with this amount of dip. An analysis of the preceding diagrams will show that the same rule holds good—viz, that the maximum pressure required is approximately in inverse proportion to the working distance traveled by the ram.

In estimating, therefore, the necessary pressure for any given pair of dies, the pressure required for flat dies without dip should first be ascertained by the formula given above, and then a reduction should be made in proportion to the increase of time during which the dies are doing their work over that due to the thickness of the metal itself, as caused by the particular amount of dip that may be present in the dies.

The pressure data given assume an upper die or punch of the same diameter as the die which it enters, such construction insuring a parallel hole through the metal. This close fitting is usually practiced with metals below $\frac{1}{16}$ inch thick, such as tin plate, &c., but is absolutely necessary with very thin metallic sheets and with soft substances, like cloth, leather, paper, &c. Indeed, a rule frequently used by the writer for accurately testing such dies has been to make them cut wet tissue paper cleanly all around. With thick metals, however, as in boiler making, bridge work, &c., it is customary to make the punch considerably smaller than the die. In some extreme cases this has been as much as one fifth of the thickness of the metal, which has been proved by certain interesting experiments tried by the Messrs. Sellers some years ago to be a proportion that requires the minimum pressure. Practically, the amount of clearance between punch and die is usually less than this, varying generally from $\frac{1}{32}$ inch to $\frac{1}{16}$ inch in metals not over $\frac{1}{4}$ inch thick. With such clearance the pressure is considerably lessened, but the holes are of course conical. In some cases this may happen to be an advantage, as when the large end can be turned outward in riveted joints, &c., but in other cases it is a detriment.

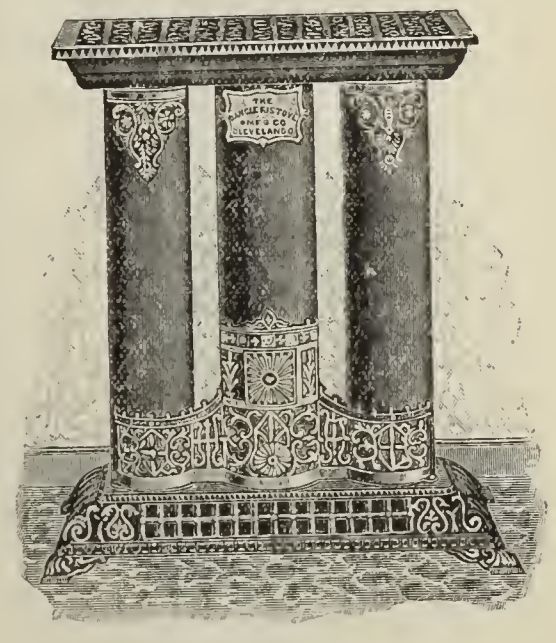
The punching pressure required when holes are located very near the edge of a sheet is somewhat lessened on account of the spreading of the metals sidewise, but this does not amount to much in practice, and such punching should be avoided.

Regarding the pressure required for stripping metal from a punch during its ascending stroke, I have no reliable data at hand. It varies considerably with the amount of punch and die clearance, the smoothness of the punch and the squareness of the stripper therewith, together with its rigidity, &c. It is undoubtedly a good deal less than one-tenth of the punching pressure, even in extreme cases. A series of experiments in this direction are certainly very desirable, and the writer hopes upon some future occasion to be able to publish an experience of this kind which he has not yet enjoyed.

Regarding the kinds of presses used for the cutting processes which have been described in this chapter, it may be said that, like the Scotchman's whisky, there are no bad kinds. In other words, almost any sort of a press is sometimes suitable—the nearest approach to an exception to this statement being perhaps the drop press tribe, whose members are generally employed in other work.

The Dangler Hot Air Radiator.

In the accompanying illustration we present a general view of a hot air radiator which has recently been placed upon the market by the Dangler Stove & Mfg. Company, Cleveland, Ohio, and for which a patent was granted last month. The radiator is referred to by the manufacturers as being new in principle, conveying its heat upward through the center flue, passing it down the two side ones, and discharging it through the openings in the base. The air by this arrangement is crowded into the top of the radiator, causing the flues to become very hot, and while radiating a great deal of heat from the top and sides, it forces the air downward to the openings in the base, enabling persons to warm their feet as readily as by means of a base burning



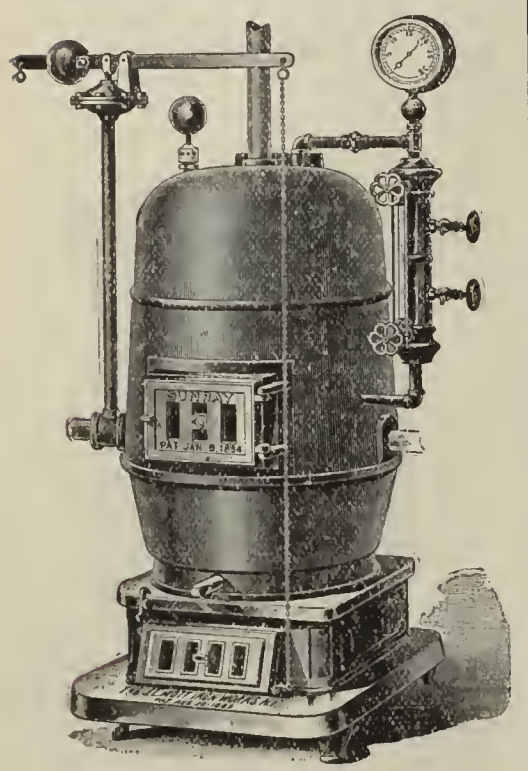
Dangler Hot Air Radiator.

parlor stove. The burner in this radiator is placed at the bottom of the center flue, which, it will be noticed, is a trifle shorter than the ones at the right and left, and is also made a trifle larger in cross section so as to be able to carry a supply of air sufficient for the other tubes. The burner frame is formed with a tubular ring having jets at intervals, and connected at its center by cross tubes and with the gas supply pipe, which passes up centrally through the base, serving as a support for the frame. By means of the construction employed there is a free circulation of air from beneath, both within and without the burner ring. The manufacturers refer to the fact that the distance which the air is forced to travel from the time it enters the central tube until it is discharged through the openings in the base is sufficient to retard the flow just enough to insure good radiation. The arrangement is also such as to render the heat easily controlled, allowing it to be distributed fast or slow, as may be desired. The grating shown at the bottom of the radiator can be easily removed for the purpose of dusting. The appearance of the device is neat, some of the parts being treated with nickel, which forms a pleasing contrast with the black iron surfaces. The radiator shown herewith has three tubes, while other sizes have four, six, eight and twelve tubes. The manufacturers state that this radiator has proven very popular with the trade, and that during the past winter and fall they sold large numbers.

STEAM AND HOT WATER.

The Sunray Steam Boiler.

The accompanying cuts illustrate a new steam heater just placed on the market by the J. L. Mott Iron Works,



Sunray Steam Boiler.—Fig. 1.—Showing Complete Apparatus.

New York and Chicago. The heater is designed for small residence work and for furnishing steam for coffee rooms, steam kettles, carving tables or any

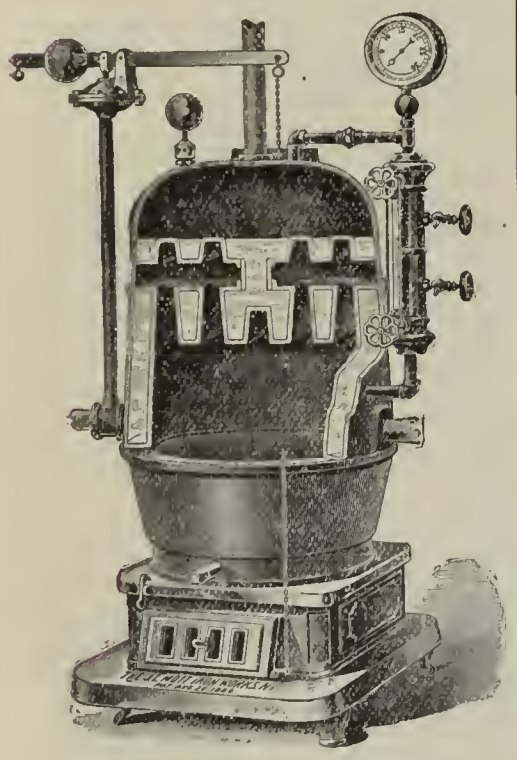
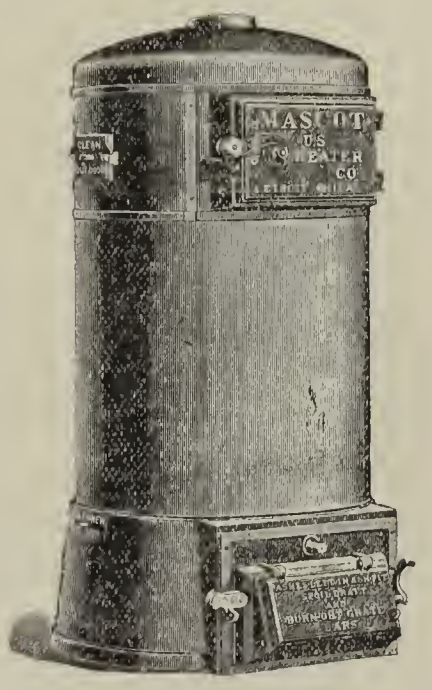


Fig. 2.—Sectional View.

other purpose requiring a moderate supply of steam at a low pressure. It is claimed that technical tests of this heater show a very high rate of economy and efficiency. It has an ample fire chamber and the heating surface is brought in direct contact with the fire, thus making a quick and powerful steamer. Fig. 1 gives the external appearance of the heater, and Fig. 2 is a sectional cut showing arrangement of fire surfaces, water line and steam chamber. It will be seen from the illustrations that no steam or water joints are left for the fitter to make, as the generating part of the heater is all put together before shipment; also that no packed or washer joints are used in its construction. It is easily handled and can be taken in at any ordinary door or window. It is claimed by the makers that this heater can be set up ready for piping in one-half hour after it has been unloaded at the building This heater is made in five sizes, with grates 14, 17 and 21 inches in diameter, and is capable of supplying from 150 to 400 square feet of heating surface, or the equivalent in any other service it may be used for.

The Mascot Heater.

We show in the accompanying illustrations views of a new heater, known as the Mascot, that is brought out by the United States Heater Company, Detroit, Mich., with Chicago branch at



The Mascot Heater.—Fig. 1.—General View of Mascot Hot Water Heater.

100 Lake street, and New England selling agents Gilchrist & Taylor, 106 High street, Boston, Mass. The heater shown in the illustrations is intended for both steam and hot water. Fig. 1 is an exterior view of the hot water heater, while Fig. 2 is a broken view of the steam heater. The constructions are essentially the same, but the upper chamber in the steam heater is larger. The water space is inclosed between a double shell, the inner surface, as shown in Fig. 2, being corrugated, giving an extended surface and increasing the efficiency of the apparatus. In the hot water heater the steam dome is replaced by a top header or distributing chamber. It is mentioned that the Mascot is so arranged that ample heating surface is presented, while the products of combustion are made to strike first the top



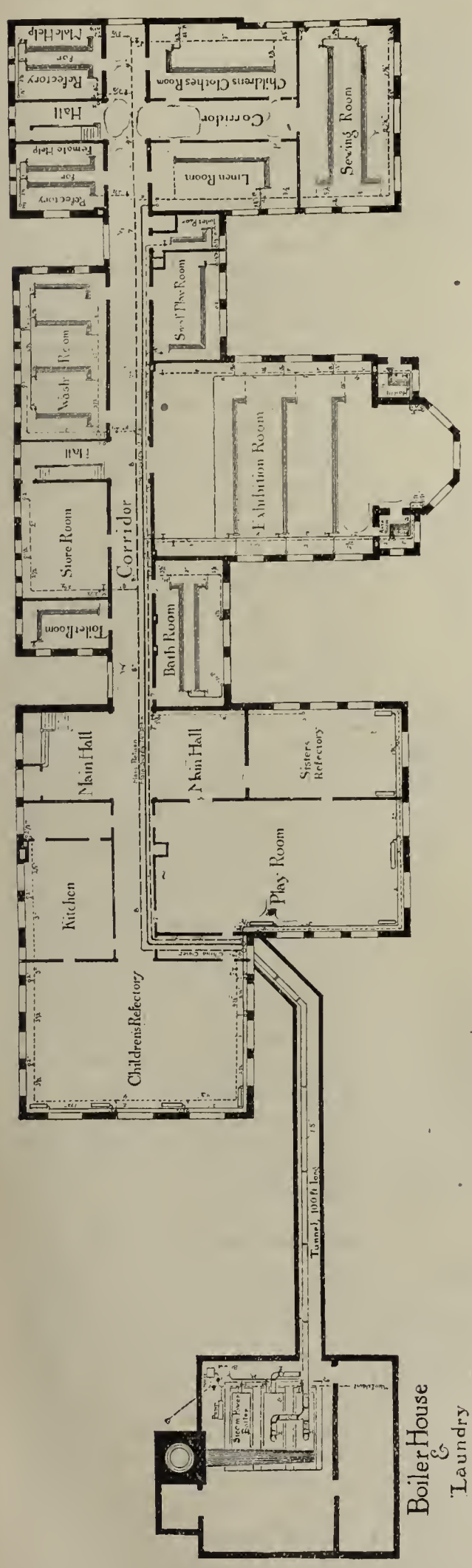
Fig. 2.—Broken View of Mascot Steam Heater.

of the heater proper, then the top header or steam dome before finding an exit through the smoke pipe. A special feature to which attention is directed is the ease with which it may be cleaned. It is also easy to handle and set up. The Mascot hot water heater is made in three sizes with diameter of grate 15, 18 and 21 inches, adapted to supply from 275 to 475 square feet of radiation in addition to mains. The Mascot steam heater likewise is made in three sizes with the same diameters of grate, adapted to supply from 175 to 350 square feet of radiation in addition to mains.

THE HOWARD THERMOSTAT COMPANY of Syracuse, N. Y., with New York office at 210 Water street, have brought out an improvement on their thermostat regulator, by which the check of the fire in the furnace is accomplished through the ash pit, thereby avoiding, it is said, any possibility of gas escaping, and affording a quick and efficient check to the fire without admitting cold air into the smoke pipe. They also have in process of manufacture a larger cylinder designed to furnish sufficient check for the largest furnace or heating apparatus constructed. This method of regulating is adapted to hot air, hot water or steam heating apparatus.

An Extensive Hot Water Plant.

The Ringen Stove Company, St. Louis, Mo., have recently completed an extensive heating contract in the St. Joseph's Orphan Asylum at St. Louis. There is a total of 19,500 square feet of hot water radiation, in addition to the mains, which are all exposed and utilized as heating surfaces. The radiation is supplied from two multitubular boilers, 18 x 60 inches in size, with 72 4-inch flues in each. The location of the boiler is shown in Fig. 1, which is a basement plan. Attached to the boilers is a Hawley down draft smokeless furnace, guaranteed by the manufacturers to effect a saving of 25 per cent in fuel. The boiler house is situated 102 feet west of main building. The boilers are connected so that either or both can be used for the purpose of firing heavy or light, according to the weather. The flow and return from each boiler are 12 inches in diameter. The two 12-inch supplies connect into one 15-inch main trunk supply, and the two 12-inch returns into one 15-inch main trunk return, which are the sole supply and return of the building, all the water passing through them. The 15-inch supply and return mains pass through a tunnel connecting the two buildings, the pipes being suspended on extra heavy rollers to permit of expansion. This tunnel is brick lined, arched, and is 6 feet high by 5 feet wide. After the 15-inch pipe enters the building it rises to the ceiling of the basement, and from this point one 4½-inch is taken first to supply the radiators situated on the floor of the basement to heat what is known as the children's refectory, playroom and sisters' refectory. Returns from these three rooms are carried back on base board into the tunnel direct and here connected with the main return. The main trunk continues, 14 inches in size, on the ceiling of the basement 130



An Extensive Hot Water Plant.—Fig. 1.—Basement Plan of St Joseph's Orphan Asylum.

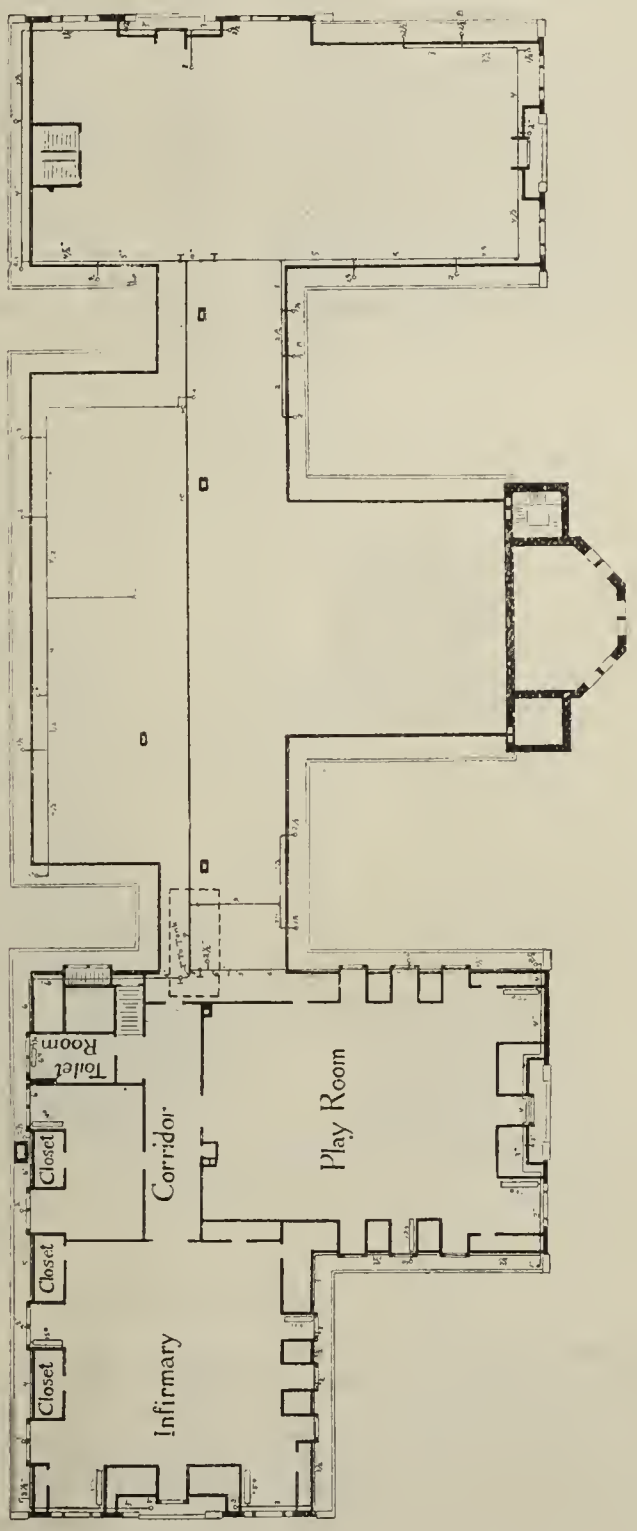
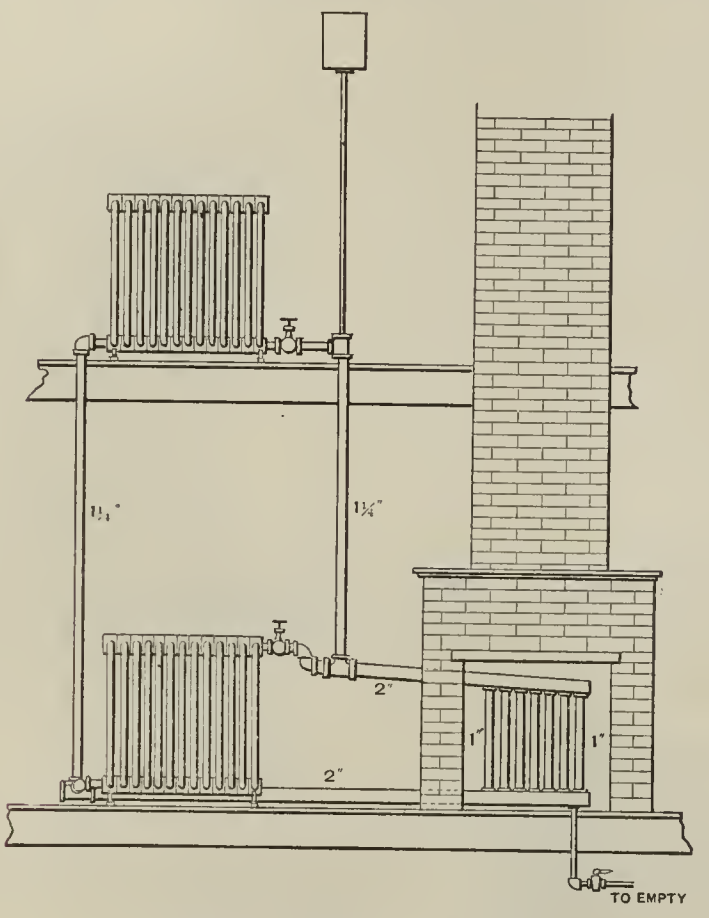


Fig. 2.—Attic Plan of St. Joseph's Orphan Asylum.

feet, and at this point a 5-inch main is taken off for the supply of radiation in the chapel. Then the main trunk continues, 13 inches in size, on the ceiling to the bottom of the trunk riser for 105 feet; this riser, being 13 inches in size, goes to the attic, a hight of 42 feet. A plan of the attic is shown in Fig. 2. From here one 5-inch and one 6-inch main are first taken off to supply all radiation on the eastern front part of the building. The trunk main continues, 12 inches in size, westward 36 feet, where a 5-inch main branch is taken off to supply all radiation on north side of the building. The main trunk continues, 10 inches in size, 110 feet, and at this, the highest point, the expansion tank is suspended over the main. At this point two 6-inch mains are taken off, supplying all radiators in the western portion of the building. The total distance traveled by the water before the last radiation is supplied measures 726 feet, and upon several tests a loss of no more than 4° to 6° of heat was recorded by a special hot water thermometer placed at convenient points. The total distance traveled over by the water in main trunk from the beginning of flow to the end of return measures 1000 feet. It was found necessary to construct special fittings throughout this entire work to promote easy and rapid circulation. Any portion of this immense plant can be shut off by a system of valves, making any part independent of any other part. Standard radiators, with top openings, are used, the flow and return being in the same loop, and the entire system is vented automatically.



Radiators Heated from Open Fire.

Radiators Heated from Open Fire.

From G. T. K., *Radford, Va.*—A copy of *The Metal Worker* of January 27 having come to my hands, it is with interest I have noticed the article on "Radiator at Boiler Level." Herewith I give you a sketch showing two rooms heated from a water back in fire place on level or same floor as lower radiator.

The winter of 1892 the back having burned out of my fire place, in which I keep constant fire, the suggestion came, why not utilize this heat? As receiver for a plumbing company I had use of tools, and a friend gave me piping and radiators from a house which burned, and the following summer I put in this apparatus. It works entirely satisfactorily by heating one room at a time, controlling by valves, in very cold weather; in moderate weather both rooms are comfortable. The water back is made of 2 inch pipe for horizontals, and the down pipes, seven in number, are of 1-inch pipe. Two-inch pipe runs through chimney and is reduced to 1¼ inches for radiator connections. The return pipe from the upper radiator connects with 2-inch return at lower radiator, passing behind lower radiator, drops below floor level in chimney and in ash pit. An 18-inch grate hangs in the usual place. The system holds about 35 gallons of water and evaporates 1 quart a month. An emptying cock is placed in the cellar.

HEATING NOTES.

M. Mahony, Troy, N. Y., follows his March calendar card with a similar one for April. The variation is in the decoration, the one for the current month being truthfully representative of a showery day.

"What Are We Here For?" is the catching title of a pamphlet issued by the United States Heater Company, Detroit, Mich. It is needless to tell what the answer to this question is, for every one knows the Capitol, Hecla and Mascot heaters made by this firm. Following a dissertation on the boilers made by the United States Heater Company is a report on the Capitol hot water heater by Leicester Allen, a well known authority in such matters. At the close are extracts from letters telling of the good results attained by these boilers.

T. R. McMann, 56–60 Gold street, New York, is one of the old houses in the pipe and fitting trade, some men of the establishment having had nearly a half century's experience and the business having been started early in the "Sixties." The progressiveness of the house is shown in their method of handling some large extra double heavy pipe that weigh 800 pounds to the length, that is being cut for an order. By means of a crane over the sidewalk, and an overhead railway in their shop, one man can bring these pipes to the machine and cut and thread them without assistance.

Johnson & Co., 71 John street, New York, agents for the Gurney Hot Water Heater Company, have a fine showroom in which they display a line of the 300 Series and Crown hot water heaters and Gurney radiators. The line is attractively painted and is displayed on platforms. The latest attraction is the new Gurney steam boiler, which is conspicuously located. A feature of the showroom that attracts not a little attention is the method of heating, which is from a small boiler of the 300 Series and radiators all on the same floor.

The Raymond & Campbell Mfg. Company of Middletown, Pa., manufacturers of the Sun heating boiler, have made some improvements in the boiler which will be appreciated by the trade. The draft door is now placed in the center of the ash pit door, and the position formerly assigned to the draft door is now occupied by a mica door, through which an attendant may observe the state of the fire when shaking down. The grate has been remodeled, its present form insuring durability and better combustion. The shaker is of entirely new design, being so adjusted that the lever works from the front and toward the attendant, instead of sideways as in the old style. The boiler has been generally redressed and presents a pleasing appearance. The company report that business in the boiler department last season assumed large proportions and sorely taxed their facilities for handling it. Anticipating their share of trade during the coming season they have added to the equipment of their boiler and erecting shop and have increased their facilities to quite an extent. At the present time they have upward of 200 boilers on the floor, in course of erection. They have just shipped a carload to Littlefield & Co. of Wakefield, Mass., and have other large orders awaiting shipment.

The Peerless is the name of a flange steel steam and hot water boiler which Geo. H. Bell & Co., 114 Nassau street, New York, are introducing. They will open a showroom at 41 Dey street May 1, and display a line of samples. The boiler has been previously noticed in our columns and is cylindrical in shape, consisting of an inner and outer annular water space, so arranged and connected as to cause an indirect draft. The outer water chamber extends up and forms a part of the boiler proper, which hangs directly over the fire. Pipes lead from the inner water chamber up into the center of the bottom of the boiler. The apparatus is provided with a labor saving grate, and both economy and great heating power is claimed for it. It is made in four sizes, with fire pot from 20 to 36 inches in diameter, and rated to carry from 200 to 1400 feet of radiation.

OBITUARY.

ARAD T. FOSTER.

As briefly announced in our last issue, Arad T. Foster, whose portrait is presented herewith, died suddenly, of apoplexy, at his home, 47 New York avenue, Brooklyn, N. Y., on March 29. Mr. Foster was well known and highly esteemed by the plumbing and heating trades, from his long connection with two prominent manufacturing concerns in this city catering to those trades—namely, the Haydenville Mfg. Company, 73 Beekman street, and Peck Bros. & Co., 47 Cliff street. At the time of his death Mr. Foster was president and general manager of the first named concern and vice-president of the latter.

Arad T. Foster was born in Canada on April 12, 1837. His father and mother were descended from some of the most distinguished families in New England. The former was a renowned physician and became a member of the Canadian Parliament and Governor of the Dominion College of Physicians and Surgeons. Coming to the United States in 1864, Arad T. Foster became connected with the plumbing supply house of Peck Bros. of New Haven, Conn., as manager of the New York branch. For 30 years he was closely identified with this concern, of which he was vice-president at the time of his death. He was also president and general manager of the Haydenville Mfg. Company, brass and iron founders and manufacturers of water, gas and steam goods, a competing concern established in 1845 by the late Governor Hayden, at Haydenville, Mass., where the firm's works are still located. This corporation was bought out by Mr. Foster and the Peck Brothers in 1884 and has been owned and operated by them since that date.

Mr. Foster was for a number of years a member of the New York Metal Exchange, and was chosen president of the Manufacturers' National Association, at Pittsburgh, in 1886, to which position he was re-elected at each succeeding annual meeting. Since its commencement, his business career was a successful one. He was a man of cool judgment and dogged perseverance, united to the strictest integrity ; generous in his nature, kind and sympathetic toward the unfortunate, and considerate to his employees. Of sterling Christian character, his religion was brightly reflected in all his domestic, social and business relations. In the words of the funeral address of his close friend and pastor, the Rev. Dr. Theo. L. Cuyler of Brooklyn, it was his religion "that made his business life so upright and his domestic life so happy. He had a large, warm heart; and I never knew a more kind and courteous gentleman. We cannot afford to lose such men as Mr. Foster. Such men are needed in the commercial world and in the community. He was a true man and bound his friends to him with 'hooks of steel.' He not only served God in the church, but he served Him all through the week by his life of strict integrity."

Mr. Foster was twice married. By his first marriage he had two promising sons, both of whom died in California, the younger having deceased but a few months ago. Mr. Foster's stepson, Cuyler K. Sanborn, was associated in business with him, and is now vice-president and secretary of the Haydenville Mfg. Company.

Mr. Foster was conspicuous in Masonic circles and a member of the Union League Club of Brooklyn. He was also an active and esteemed member of the Lafayette Avenue Presbyterian Church in that city.



ARAD T. FOSTER.

On Monday, April 30, and Tuesday, May 1, during the day and evening, there will be a large exhibit of drawings made by members of the freehand, mechanical, architectural and carriage drafting classes, also manuscripts from the penmanship, bookkeeping, shorthand and typewriting, arithmetic, steam engineering and electricity classes of the Young Men's Institute, 222 Bowery, New York. All persons interested in such work are invited to visit the rooms and inspect the work done by the pupils. On Tuesday evening, May 1, the closing exercises of the classes will be held in the Institute Hall. Certificates of progress, diplomas and prizes will be awarded and there will be special music and addresses. The work of the school year 1893-94 has been very satisfactory, with an enrollment of about 635 young men in 11 studies. The committee are planning to add one or two new subjects to the curriculum for 1894-95. The fall term will begin October 3, 1894. Enrollment can be made any time during the spring, summer or early fall.

The opening of the Chilean National Mining and Metallurgical Exposition, which was to occur at Santiago during the current month, has been postponed by decree of the Supreme Government until September next. The postponement has been decided upon in order to give opportunity for more thorough preparation by the Government, and because it was thought impracticable for exhibitors to prepare and forward their exhibits in the short time allowed. The exhibition will be divided into the following sections: Motive power, electricity, mining machinery, mechanical preparation of minerals, metallurgy, chemical industries, statistics and plans, and mining and metallurgical products. The Government will convey gratis to the exhibition all articles comprised in the above classifications which it may be desired to exhibit. The Government will also pay the passage money by sea and land of the workmen and operatives whom exhibitors may desire to send for the purpose of setting up and running the machinery and apparatus they exhibit. Application for space should be made to the Chilean Legation at Washington, D. C.

A New Aluminum Solder.—One of the most perplexing questions encountered in the development of the uses of aluminum has been that of soldering the metal. In many instances the effort has been made to get around the difficulty by riveting, a method frequently awkward and often leading to structural weakness. A series of tests were recently made of a solder which is being introduced by the Alsite Aluminum Company, 106 and 108 Liberty street, New York. Among the tests made were butt welds of sheets and plates, which under tension showed the soldered joint to be so well made that rupture took place in every instance outside of the joint. Strips connected by butt soldering were twisted in the vise without opening the seam, and soldered tubing has been successfully drawn recently. The surfaces to be soldered are cleaned by dipping in a hot solution of soda or potash, then dipped into nitric acid, rinsed in hot water and dried. Sometimes the surfaces are cleaned by filing the edges to be joined. The parts to be soldered are heated as hot as can safely be done without melting and a small portion of the solder is spread over the edges by means of a soldering brush, which should be kept heated during the process. The edges are then joined and more solder is applied and spread evenly over with the brush. During the entire operation the metal is kept as hot as possible, and it is completed when the solder becomes distinctly white or the aluminum assumes a reddish hue. Authorities on the working of aluminum have acknowledged that soldering by the Alsite process accomplishes results not hitherto attained.

Philadelphia is to spend some $14,000,000 this season on city improvement work of a permanent character. This includes a subway for the Reading Railroad, miles of new street pavement, a better sewerage system, &c. This work will furnish employment for some thousands of the unemployed in the coming months.

The approaching consolidation of some of the largest Chicago packing houses is stated to be a fact.

TIN PLATES.

American Tin Plate Manufacturers.

The following revised list of concerns engaged in the manufacture of tin and terne plates in the United States is extracted from the report of Col. Ira Ayer, special Treasury agent, for the quarter ended December 31, 1893:

Revised list of firms or companies engaged in tin and terne plate manufactures, December 31, 1893. (*a*, made sworn return; *s*, manufacture suspended; *b*, building; ‖, making or preparing to make black plates; †, make only black plates; ‡, manufacturing—failed to make sworn returns.).

NOTE.—In the following list are included the names of such firms or companies, only, as were manufacturing, or had begun building operations, prior to December 31, 1893.

A. A. Thomson & Co., *a*, New York, N. Y.
Alan Wood Co., ‖ *s* †, Philadelphia, Pa.
Aliquippa Tin Plate Co., *s*, Aliquippa, Pa.
American Stamping Co., *a*, Brooklyn, N. Y.
American Tin Plate Co., ‖ *a*, Elwood, Ind.
American Tin Plate Machine & Mfg. Co., *a*, Linfield, Pa.
American Tin & Terne Plate Co., *a*, Philadelphia, Pa.
Apollo Iron & Steel Co., ‖ *a*, Apollo, Pa.
Baltimore Steel, Iron & Tin Plate Co., *a*, Baltimore, Md.
Black Diamond Tin Plate Works, *a*, Philadelphia, Pa.
Blairsville Rolling Mill & Tin Plate Co., ‖ *a*, Blairsville, Pa.
Britton Rolling Mill Co., ‖ *b*, Cleveland, Ohio.
Burn Stamping & Mfg. Co., *s*, Chicago, Ill.
Canonsburg Iron & Steel Co., ‖ *a* †, Canonsburg, Pa.
Chicago Stamping Co., *b*, Chicago, Ill.
Chicago Tin Plate Mfg. Co., *a*, Chicago, Ill.
Cincinnati Corrugating Co., *a*, Piqua, Ohio.
Cleveland Tin Plate Co., *a*, Cleveland, Ohio.
Columbia Tin Plate Co., *s*, Piqua, Ohio.
Cumberland Steel & Tin Plate Co., ‖ *a* †, Cumberland, Md.
Duquesne Tin Plate Works, *a*, Pittsburgh, Pa.
East River Lead Co., *a*, New York, N. Y.
Falcon Tin Plate & Sheet Co., ‖ *a* †, Niles, Ohio.
Griffiths & Cadwallader, *a*, Pittsburgh, Pa.
Gummey, Spering & Co., *a*, Philadelphia, Pa.
Hughes & Patterson, ‖ *a*, Philadelphia, Pa.
Indiana Tin Plate Mfg. Co., *s*, Atlanta, Ind.
James B. Scott & Co., *a*, Pittsburgh, Pa.
Jennings Bros. & Co., Ltd., ‖ *a* †, Pittsburgh, Pa.
John Hamilton, *a*, Pittsburgh, Pa.
Kirkpatrick & Co., Ltd., ‖ *a* †, Pittsburgh, Pa.
Lalance & Grosjean Mfg. Co., ‖ *a* †, New York, N. Y.
Laufman Tin Plate Co., *s*, Butler Junction, Pa.
Locust Point Iron & Steel Works Co., ‖ *a*, Baltimore, Md.
Marshall Bros. & Co., ‖ *a*, Philadelphia, Pa.
Matthai, Ingram & Co., *a*, Baltimore, Md.
McKinley Tin Plate Co., *a*, Wilkinsburg, Pa.
Merchant & Co., *a*, Philadelphia, Pa.
Meurer Bros. Co , *b*, Brooklyn, N. Y.
Morewood Co., ‖ *a*, Gas City, Ind.
Morewood Tin Plate Mfg. Co., *a*, Elizabethport, N. J.
New Castle Steel & Tin Plate Co., ‖ *a*, New Castle, Pa.
N. & G. Taylor Co., *a*, Philadelphia, Pa.
Norristown Tin Plate Co., *a*, Norristown, Pa.
Norton Bros., ‖ *a*, Chicago, Ill.
Philadelphia Tin Plate Co., *b*, Philadelphia, Pa.
Phillips Tin Plate Co., *a*, Philadelphia, Pa.
P. H. Laufman & Co., Ltd., ‖ *a*, Apollo, Pa.
Pittsburgh Tin Plate Works, *a*, New Kensington, Pa.
Record Mfg. Co., *a*, Conneaut, Ohio.
Saunders, Fielding & Bond, ‡, New York, N. Y.
Somerton Tin Plate Works, ‖ *a*, Brooklyn, N. Y.
St. Louis Stamping Co., ‖ *a*, St. Louis, Mo.
United States Iron & Tin Plate Mfg. Co., ‖ *a*, Demmler, Pa.
Wallace, Banfield & Co., Ltd., ‖ *a*, Irondale, Ohio.
Western Tin Plate Works, *a*, Belleville, Ill.

Total number of companies December 31, 1893	56
Number that made sworn returns of manufacture	45
Number of companies manufacturing, but failed to make sworn returns	1
Number of companies manufacture suspended	6
Number of companies building	4
Number of compauies making or preparing to make black plates	22
Number of companies that made sworn returns of black plate production	17
Number of companies making only black plates	7
Number of new companies	4

SCRAP.

THE QUARTERLY REPORT of the United States Iron & Tin Plate Mfg. Company, Demmler, Pa., to the Special Agent of the United States Treasury Department shows that during the quarter ending March 31,1894, the output of the above concern was as follows: 2,020,767 pounds of tinned plates; 1,186,360 pounds of black plates for tinning, or a total of 3,207,117 pounds. Of this 2,867,648 pounds were lighter than 63 pounds and 339,469 pounds over 63 pounds per 100 square feet.

THE BRITISH BOARD OF TRADE STATISTICS for March, 1894, show the shipments of tin and terne plates from the United Kingdom to the United States during the month to have been 16,000 tons, as compared with 31,000 tons in March, 1893. The total tin plate exports to all countries during the month of March were 25,000 tons, as against 42,000 tons last year.

A PATENT has been granted in England to F. Player and D. Mainwaring of Ystalyfera, South Wales, for a new method of cleaning metal plates. The system is thus described: Pairs of rollers having surfaces of suitable material, the two rollers of each pair revolving at different speeds, are kept apart the proper distance by springs inserted between the bearings, the slack being taken up as the surfaces wear. The plate is delivered to the first pair, and is by them passed on to the next without the intervention of any carrying rollers. In consequence of the rollers turning at different speeds, both surfaces of the sheet are rubbed alternately by the top or bottom rollers of the successive pairs, or the rollers may be joined by belts which would be running at different speeds, and the plate would be simultaneously carried forward and rubbed between the surfaces of the upper and lower belts. For polishing tin plates it is only necessary to pass them through the machine, but for removing the grease the rollers or belts must be fed with bran or some other cleaning material.

The Production of Tin Plate.

The special report to the Secretary of the Treasury by Ira Ayer, special agent, Treasury Department, relative to the production of tin and terne plates in the United States during the quarter ended December 31, 1893, with comparative statements of production dated March 22, 1894, has been received, and shows the following results of his investigations:

A total of 39 firms manufactured 27,351,241 pounds of tin and terne plates proper, against an output of 27,145,430 pounds by 35 firms during the previous quarter. Of the output for the quarter, 15,907,669 pounds, more than 58 per cent., was made from sheets rolled in the United States. Of this amount, 15,309,009 pounds, more than 96 per cent., consisted of the class of plates weighing lighter than 63 pounds per 100 square feet. Of the commercial plates made during the quarter, 14,682,045 pounds were coated with tin, and 12,669,196 pounds were terne coated. More than 96 per cent. of all the commercial plates belonged to the lighter class. The quantity of American sheet iron and steel made into articles and wares tinned or terne plated was 1,244,707 pounds. This makes the aggregate output for the quarter from all sources 28,595,948 pounds; previous quarter, 28,198,293 pounds.

The production for the quarter subject to comparison with net imports under the recent ruling of the Department, inclusive of products from American sheet iron and steel, tinned or terne plated, was 16,553 716 pounds, as compared with 9,257,610 pounds during the previous quarter. The total for the two quarters was 25,811,326 pounds.

Three companies, Hughes & Patterson of Philadelphia, Pa.; the New Castle Steel & Tin Plate Company of New Castle, Pa., and the Western Tin Plate Works of Belleville, Ill., made their first sworn returns to the Government. The works at New Castle are complete, both for rolling and coating tin plates, and during the quarter operations were carried on in both branches of manufacture. The number of firms submitting sworn statements of production in excess of previous quarter was four. Besides the Western Tin Plate Works above named the Chicago Stamping Company of Chicago, Ill.; the Meurer Bros. Company of Brooklyn, N. Y., and the Philadelphia Tin Plate Company of Philadelphia were engaged during the quarter in erecting the necessary machinery for coating the plates.

Black Plate Production.—The production of black plate in the United States during the quarter was 19,679,910 pounds, of which 17,197,664 pounds, or nearly 90 per cent., belonged to the class weighing lighter than 63 pounds per 100 square feet. The production of the previous quarter was 11,355,368 pounds, of which 8,147,092 pounds, or about 72 per cent., was of the lighter class. The production of American black plates of the class weighing lighter than 63 pounds per 100 square feet was 2,989,472 pounds in excess of that of any previous quarter since the law became operative. Seventeen rolling mills made sworn returns of production, against 16 for the preceding quarter.

Consumption of American Plates.—Of the 39 firms making sworn returns of the manufacture of commercial tin and terne plates 21 used wholly American plates, with an output of 12,576,443 pounds; 12 used both American and foreign plates, with an output of 10,174,755 pounds, of which 3,331,226 pounds, or about 33 per cent., was made from sheets rolled in the United States; six used wholly foreign plates, with an output of 4,600,043 pounds. Sixteen stamping or other manufacturing companies that use American sheet iron and steel in the manufacture of articles and wares tinned or terne plated submitted sworn statements of production, as against 18 during the previous quarter. The aggregate consumption of American plates in the various forms of manufacture was 17,152,376 pounds, which was equal to about 90 per cent. of the entire production of such plates during the quarter.

The following is a condensed comparative statement of the manufacture of tin and terne plates proper during the fiscal years ended June 30, 1892 and 1893, and the six months ended December 31, 1893:

Period of manufacture.	Amount made from— American black plate.	Per cent. American.	Foreign black plate.	Per cent. foreign.	Total.
	Pounds.		Pounds.		Pounds.
Quarter ended September 30, 1891.	785,547	95.00	41,375	5.00	826,922
December 31, 1891.	1,200,661	85.16	209,160	14.84	1,409,821
March 31, 1892.	2,132,082	66.44	1,077,143	33 56	3,209,225
June 30, 1893.	5,178,263	63.14	3,022,488	36.86	8,200,757
Totals	9,296,553	68.12	4,350,166	31.88	13,646,719
From September 30, 1892, to June 30, 1893.	43,599,724	43.68	56,219,470	56.32	99,818,202
Quarter ended September 30, 1893	8,794,027	32.46	18,351,453	67.60	27,145,480
December 31, 1893.	15,907,669	58.16	11,443,572	41.84	27,357,241
Totals for year 1893.	54,337,889	.....	69,268,818	.....	123,606,707

The amount of American sheet iron and steel made into articles and wares tinned or terne plated during the same period was as follows:

	Pounds.
From July 1, 1891, to June 30, 1892, total	5,620,867
From July 1, 1892, to June 30, 1893, total	8,802,681
Quarter ended September 30, 1893	1,052,813
Quarter ended December 31, 1893	1,244,707
Total calendar year 1893.	7,350,306

The amount of American black plates used in the aggregate manufactures during the period from July 1, 1891, to December 31, 1893, was:

Quarter ended—	Pounds.
September 30, 1891.	1,914,764
December 31, 1891.	2,159,991
March 31, 1892	3,620,343
June 30, 1892.	6,822,322
September 30, 1892.	7,197,014
December 31, 1892.	10,516,412
March 31, 1893.	14,102,299
June 30, 1893.	20,586,680
September 30, 1893.	9,846,840
December 31, 1893.	17,152,376

A very instructive statement has been compiled, showing the rapid development of the production of sheet steel or black plates. The table below proves how rapidly American manufacture increased the output of plates lighter than 63 pounds per 100 square feet. It will be noted that while in the earlier periods the heavier plate represented by far the larger percentage, the quantity of light plates rose to its maximum, even during the panic period of the fourth quarter of last year.

Statement by Quarters of Fine Sheet Steel, or Black Plates, Produced in the United States from July 1, 1891, to December 31, 1893.

Periods.	Lighter than 63 pounds per 100 sq. feet.	63 pounds per 100 sq. feet and heavier.	Total.
Quarter ending—	Pounds.	Pounds.	Pounds.
Sept. 30, 1891	489,107	3,016,006	3,505,113
Dec. 31, 1891.	679,584	4,593,416	5,273,000
March 31, 1892.	1,696,595	4,909,370	6,605,965
June 30, 1892.	4,761,641	6,067,537	10,289,178
Totals	7,626,927	18,586,329	26,213,256
Quarter ending—			
Sept. 30, 1892	4,821,180	4,202,277	9,023,457
Dec. 31, 1892.	8,575,541	5,444,675	14,020,216
March 31, 1893.	13,287,507	6,261,848	19,649,355
June 30, 1893.	14,208,192	6,780,321	20,988,513
Totals	40,892,420	22,789,121	63,681,541
Quarter ending—			
Sept. 30, 1893.	8,147,092	3,208,276	11,355,368
Dec. 31, 1893.	17,197,664	2,482,246	19,679,910
Totals	25,344,756	5,690,522	31,035,278

Imports and Exports.—The quantity of tin plates and terne plates imported and entered for immediate consumption and of such as were imported on and after July 1, 1891, and were withdrawn from warehouse for consumption during the quarter ended December 31, 1893, was:

Imports.	Lighter than 63 pounds per 100 sq. ft.	63 pounds per 100 sq. ft. and heavier.	Total.
	Pounds.	Pounds	Pounds.
Tin plates	72,612,906	1,337,023	73,949,929
Terne plates	9,775,513	120,941	9,896,454
Totals	82,388,419	1,457,964	83,846,383

The quantity of tin plates and terne plates on which duties were paid and which were used in the manufacture of articles exported with benefit of drawback during the quarter was:

Exports.	Lighter than 63 pounds per 100 sq. ft.	63 pounds per 100 sq. ft. and heavier.	Total.
	Pounds.	Pounds	Pounds
Tin plates	32,663,671	86,540	32,750,211
Terne plates	4,423	.....	4,423
Totals	32,668,094	86,540	32,754,634

FLASHINGS.

AULD & CONGER, Cleveland, Ohio, are sending out to the trade and to architects a card bearing a *fac simile* of the official ribbon which was evidence of a premium awarded to Auld & Conger by the World's Columbian Exposition for their Bangor roofing slate. The ribbon *fac-simile* is mounted on a heavy cardboard, on the reverse of which is a table giving the number of slate in any number of squares from ½ up to 60 squares. In connection with this table attention is also directed to the Mammoth Vein sea green slate and Bangor Union slate. In sending this advertisement to the trade, and more especially to architects, it is the derire of Messrs. Auld & Conger to persuade them to specify particular brands of slate for roofing contracts. It is well known that the practice of specifying tin plate brands is extensively carried out, and it is now suggested that the same plan might be followed to advantage in roofing slate. It is pointed out that to merely specify No. 1 roofing slate is altogether too indefinite, and it could be legally filled by the product from a hundred quarries, no two of which would be of equal value.

THE STRIKE of slaters in the Bangor district, Pennsylvania, mentioned last week, is practically over. Most of the men have returned to work. There has been no increase in wages.

THE ST. PAUL ROOFING, CORNICE & ORNAMENTAL COMPANY filed articles of incorporation with the Secretary of State, April 2, with a capital stock of $100,000. The incorporators are P. A. de Launirs, C. D. Pruden, A. K. Pruden, J. Sersen and H. Pruden.

GEORGE A. OHL & Co., Newark, N. J., announce to cornice makers, sheet metal workers and the trade in general that they have executed a contract making them the sole manufacturers of the Vulcan Company's tools and machines. In their circular note they refer to the fact that heretofore the tools of this company have been restricted to the use of the members of the Vulcan Company, but now, in conformity with the contract mentioned, George A. Ohl & Co. are offering them to the trade.

THE ILLINOIS ROOFING & SUPPLY COMPANY, 203 Lake street, Chicago, have just issued a 20-page catalogue of some specialties. Designs are shown of Imperial pressed steel brick, patent rock face brick and stone siding, corner trimmings of rock face and plain brick, continuous rock face stone for belt courses and window trimmings, &c. The designs illustrated are of a varied character, changes being made in details for the purpose of securing harmony with other details of building construction. Illustrations are given of buildings sided with the various materials, some with plain and others with ornamental cornice and side trimmings, &c. Instructions are printed how to lay pressed steel brick and put in window frames and doors. It is a most interesting catalogue on this subject.

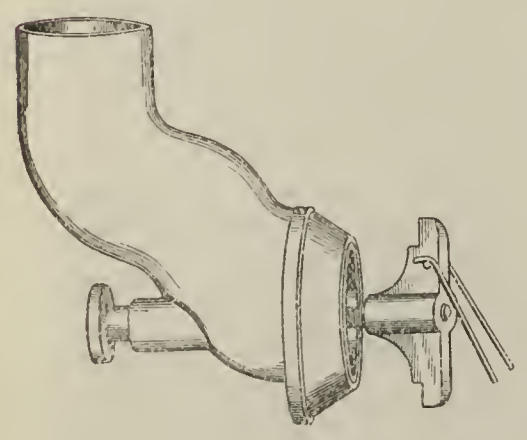
THE GLOBE VENTILATOR COMPANY, Troy, N. Y., report that they have recently placed three large sized ventilators on the new State Armory at Geneva, N. Y.

THE KNISELY & YELDHAM ROOFING COMPANY, 68–74 West Monroe street, Chicago, are doing the galvanized iron cornice work on the building of Edward Ellis, 155–157 Madison street.

PLUMBING and GAS FITTING.

Closet Repair Coupling.

The accompanying illustration is of a coupling for connecting the water supply to an earthen closet on which the supply horn has become broken or damaged by settling of floor, jarring, or by accident. It has also been adopted by manufacturers of closets and used on new goods instead of the regular earthen supply horn. The coupling has been invented and patented by J. H. Savill, and placed on the market by Savill, Walls & Co., of 1229–31 Budden street, Philadelphia. It consists of four brass pieces, a supply arm with a tapering nozzle, over which fits a tapering rubber washer ; a screwed connecting bar, the upper end of which is ground to make a seat in the boss or lug cast in the supply arm, and a cross bar, having a wire spring attached. In use the cross bar is removed and inserted in the water way or flushing rim of the closet, the spring holding it firmly. The supply arm is then placed in the position it



Closet Repair Coupling.

is to occupy over the supply hole, and the screwed connecting bar passed through the supply arm and screwed into the cross bar until the rubber washer on the nozzle expands and makes a firm yet flexible joint. The head of the screw bar is ground in such a way as to insure a perfectly tight joint, even if the cross bar resting on the round of the flushing rim forces the screwed bar into a position out of direct line. The makers state that the coupling does not in any way interfere with the flush, but on the other hand tends to aid its right and left distribution. The coupling is made in two styles. bent, as in cut, and straight and to suit lead and iron pipe. The diameter of the bore is 1¼ inches.

James Meath, Samuel Dickson and Hugh McDonald, the Plumbers' Examining Board of Detroit, Mich., have been receiving applicants for certificates from master plumbers and journeymen, the journeymen being divided into two classes. The examination for a first class journeyman's certificate is nearly as rigid as that for master's certificate. All applicants are required to answer at least 60 per cent. of the questions. Those who fail are allowed to try again at any subsequent Friday evening on which an examination is held.

Plumbing Regulations of Memphis, Tenn.

Be it ordained by the Legislative Council of the City of Memphis that all plumbing work within the city shall be done and maintained under the following rules and regulations, divided into articles, viz.:

Article 1. No person shall proceed with any portion of drainage or sewerage, or alter old or new work, until they have filed at the office of the City Engineer a notice of the work to be performed.

Aricle 2. Such notice shall consist of a clear description of the work to be performed and be accompanied with a plan in duplicate, showing the different connections and locations of the different features, from the outlet at the main sewer to the termination above the roof.

Plans to be approved or rejected with the least possible delay within 24 hours—holidays and Sundays excepted—after date of filing.

Article 3. All plans must be legally drawn in ink on white paper. One vertical section in duplicate of plumbing arrangement will be sufficient if it can be made to show all the work ; if not, two or more drawings shall be furnished. Size of paper, 8½ x 12½ inches.

Article 4. No work shall be commenced until the plans are approved by the City Plumbing Inspector.

Article 5. After a plan has been approved, no alterations of the same will be allowed except on a written application.

Article 6. The City Plumbing Inspector must be notified in writing whenever any work is ready for inspection, and all work must be left uncovered and convenient for examination until inspected and approved by the City Plumbing Inspector, who will inspect the work within two working hours after he has set for inspection, provided a written notice was filed on the day previous, and he will issue certificate of inspection and approval at the time of final inspection.

Article 7. All plumbing work in new buildings and new work in old buildings, together with any old work which may be allowed to remain, shall be treated by the plumber, in the presence of the City Plumbing Inspector, with water or air, as the plumber may select. The tests to be as follows :

Water test to be applied from the roof of building to the end of iron pipe where connection is made with stone pipe. Air test, 15 pounds for 30 feet and under, and 20 pounds pressure for over 30 feet, vertical pipe. The work tested to stand the water test without any leakage, or stand the air test without any diminution of pressure on the gauge for ten minutes.

Note.—Any old work must be tested with water or air and found tight before it be allowed to remain and be incorporated with new work. This rule not to apply to additions to old work that is in good condition.

Article 8. Every building shall be separately and independently connected with the city sewers. Each tenement to be considered a separate building. All lines of 6-inch pipe in private property shall have not less than 10 feet of 4-inch pipe to closet or slop sink. This is for places where a number of small houses are on one lot.

Article 9 All pipes receiving the discharge from water closets, from 14 inches below the surface of the ground, except in roadways, where 2 feet will be required, to 6 inches above the eaves of the roof, must be of cast iron, 4 inches inside diameter, put away (20 feet minimum distance) from all windows and left open on top. All branches or extensions of sewer connections, whatever use they may serve, if more than 7 feet in length, must be ventilated by same size cast iron pipe to 6 inches above the eaves of the roof.

Article 10. All horizontal 4-inch cast iron pipe used for soil or waste, below or above ground, or placed on wall in cellars, shall have fittings and 4-inch brass trap screws on ends and on the main line, and not over 25 feet apart. All 2-inch cast iron waste pipe shall have Y-branches and 2 inch brass trap screws, as best located to clean out same.

Article 11. All stone pipe shall be of good quality vitrified salt glazed sewer pipe, free from blisters, thoroughly glazed and burned, straight, and of uniform texture, with good hells of sufficient size to insure proper jointing. All connections shall be made with Y-branches and all changes in direction with curved pipe or Y-branches.

Cast Iron Pipe.—All connections shall be made with Y-fittings. Sanitary tees can only be used on vertical pipes. No waste pipe shall he topped into soil pipe or trap of any other fixture, hut shall have separate fittings (side outlet Y on sanitary T considered separate fittings).

No double hubs or sleeves to be used on vertical or horizontal lines of iron pipes used for the discharge of waste or liquid, except for connections.

Article 12. All joints of cast iron with lead pipes shall be made with a brass Raymond or other approved make of ferrule of same size as lead pipe set into the hub of the iron pipe and calked with lead, and to be attached to the lead pipe by a wiped solder joint.

All joints in lead pipes must he made with solder and wiped, if possible. All joints in cast iron to he made with packed oakum and molten lead, well calked, the lead to he at least 1½ inches deep and joint made water and air tight. The joints to he left as calked until tested. All joints in earthen pipes shall be made with good hydraulic cement proportioned one to one with clean, sharp sand, gasket of oakum to be used on the end of each joint to keep the cement from entering the pipe. Care must be taken that the inside of the pipe is perfectly cleaned out before a connection is made with the house, the ends of all pipes to be kept closed during construction.

Article 13. All waste pipes, when less than 2 inches diameter, shall he of lead.

No pipe allowed less than 1¼ inches inside diameter. All waste and vent pipes 2 inches inside diameter and over the pipe and fittings shall be cast iron. Galvanized or rustless wrought iron pipe may be used for vent pipes. No waste pipe from refrigerator or other receptacle in which food or provisions are stored shall he connected with a drain, soil or other waste pipe, but must be separated therefrom, emptying into an open sink furnished with a trap.

All waste pipes from interior plumbing, exclusive of water closets and urinals, when less than 7 feet in length, can he discharged into an open trapped yard sink. If over 7 feet in length, ventilated pipe must he carried 6 inches above the eaves of the roof. If five or more fixtures are attached, waste pipe shall he 2 inches inside diameter or over.

Only one fixture allowed on 1¼-inch waste pipe, vent pipe to he same size as waste pipe.

Article 14. In all house connections the line of pipe as to grade and direction must he as straight as possible and located on same lot as house. For one line of pipe ditch to be not less than 18 inches wide ; for two lines, ditches must be 30 inches wide.

Grade to he uot less than 1 to 50. In all ditches where the hottom is unsafe from any cause, as made ground, old wells and vaults filled up, &c., the grade of pipe must he made safe either by concreting, planking or the use of iron pipe, &c. All ditches must be properly graded, bells cut out and made clean of loose dirt.

If water pipe is placed in a sewer ditch it must he placed well to one side and above the sewer pipe and must be of extra strong lead. Iron water pipes must he placed in separate ditches.

Article 15. Any line of pipe connected with the city sewers if within 4 feet distance of brick wall of dwelling or any

building containing a cellar or basement or within 6 feet in solid clay, or 10 feet in made ground, of well or cistern, shall be of cast iron pipe. Stone pipe can be used under houses only where there are no cellars, and it is not inclosed, but rests on piers In passing through cellar or basement, pipe shall be attached to walls where possible.

ARTICLE 16. All water closets and separate fixtures must be trapped as close as possible, not more than 10 inches from weather ceil to floor. In no case shall cast iron hopper be leaded into pipe or trap, but shall be fastened down with brass screws; on cement or brick floors, iron hoppers shall be fastened on a flange with brass screws or set screw bolts. All earthenware hoppers and washout closets shall be fastened to lead or brass flange soldered to ferrule and fastened by brass screws or bolts. No fixtures allowed in cellars or basements where there is danger of back water from the city sewers.

ARTICLE 17. Cast iron traps with hand holes shall not be used. No bell trap, running trap or any trap depending for its seal on a movable part shall be used. No water closet shall he used which has an unventilated space of more than 100 cubic inches between two water seals, or which has such unventilated space of any capacity in which any part of the mechanism moves or the walls of which are not flushed at all points at each use of the closet. This includes the pan, Defiance and all other closets of similar construction.

ARTICLE 18. All S and P lead traps for small fixtures which are back vented from the crown of trap shall be of the same size as the water pipe. All 2-inch cast iron traps shall have trap screws.

ARTICLE 19 All kitchen sinks for hotels, restaurants, boarding houses, &c, shall have some standard grease trap attached. Grease traps are also recommended for use in private residences.

All yard slop sinks shall not be less than 2½ feet square, the frame filled in with broken stone or hard brick concrete tamped until solid and finished smooth with good cement; size of timbers 2½ x 12. See plan at engineer's office.

Catch basins, if allowed, to be located and built according to plans on file at the city engineer's office.

ARTICLE 20. In cleaning out house connections all broken or damaged pipe must be replaced with sound pipe, well oakumed and cemented, and must be inspected before ditch is filled in.

ARTICLE 21. All ventilation pipes on outside walls in public or private alleys shall come through the wall not less than 6 feet above the grade of said alley for protection from damage by passing vehicles. Before ventilation pipe is attached to the wall of building on adjacent property the consent of the owner of said property must be obtained.

ARTICLE 22. All 4-inch soil and ventilation pipe and fittings on the inside and outside of dwellings and buildings shall be cast iron pipe. No soil or ventilation pipe shall rest on stone pipe, but on cast iron bent or Y firmly supported and with a short piece of cast iron pipe 2 feet long attached horizontally to which the stone pipe connects. Vent pipes to yard closets shall not be less than 8 feet above the ground.

ARTICLE 23. All waste pipes must be trapped at each separate fixture, and as close as possible to fixture. Laundry tubs of not more than three parts to be considered as one fixture.

ARTICLE 24. All traps if found necessary to prevent syphonage or back pressure must be furnished with a vent pipe from crown of trap.

The vent pipe from a water closet trap must be at least 2 inches inside diameter. Where the back vent pipes from more than four water closet traps (other fixtures are included) are combined, or the vent pipe from four water closet traps is over 30 feet in length, the size of the vent pipe must be increased to 3 inches inside diameter, and must be carried 6 inches above the eaves of the roof, or may be run into soil pipe 5 feet above the highest fixture. In buildings over six stories high the size of vent pipe must be same as soil pipe, and must be carried 6 inches above the eaves of the roof. Other vent pipes from traps must be as large as the respective waste pipes, but where five or more are combined, or the vent pipe from one trap is over 30 feet in length, the size of vent pipe must be increased to 2 inches inside diameter and carried 6 inches above the eaves of the roof, or may be run into soil pipe 5 feet above the highest fixture. Where two or more fixtures are attached to a 2-inch waste pipe, all traps shall be back vented.

All washouts or other closets that have the trap attached above the floor, the trap must he back vented, syphon closet excepted. No running traps or back water valves or any manner of obstruction to the full flow of air through the whole course of pipe will be allowed.

ARTICLE 25. All water closets and urinals hereafter constructed in any building within the city of Memphis shall be placed in a room with not less than 12 square feet of floor space thoroughly ventilated. This room in dwellings shall not communicate directly by means of door or opening whatever with any sleeping room or sitting room or apartment which is occupied by any human being during as many as two out of 24 consecutive hours. The room shall have at least one window (2½ x 6 feet) to the open air, with upper and lower movable glass sash hung on weights, or window of same area on pivots (2½ x 3 feet).

ARTICLE 26. The discharge from hydraulic elevators must first enter a drum of sufficient size to hold the entire discharge, from which the water will pass to the sewer without pressure. The drum must be thoroughly trapped and ventilated.

ARTICLE 27. Steam or hot water from any source must first enter a receiving basin or condenser properly trapped and ventilated. The size of the basin may be reduced by the use of twin or double valve, allowing the escape of sufficient cold water at the same time with the steam or hot water to reduce the temperature.

ARTICLE 28. All water closets shall be located so as to have not less than 15 feet sewer connections to the city main and not less than 5 feet inside of property line.

ARTICLE 29. No trap vent shall be used as a waste or soil pipe.

ARTICLE 30. Overflow pipes from fixtures must be connected on inlet side of trap.

ARTICLE 31. All alterations and additions on old sewer, soil or waste pipes shall be made in accordance with these rules.

SECTION 2. Be it further ordained, that the foregoing rules and regulations be, and they are hereby, substituted in lieu and stead of the plumbing rules and regulations provided for in section 258 F, subsection 2, sub division G, and the said subdivision of said sub-section is hereby repealed.

TRAPS AND VENTS.

BOLGER & REGAN, plumbers and hardware dealers at Gloucester, Mass., were visited by fire April 6, and though their building and stock was not entirely destroyed, much damage was sustained.

JAMES E. MURPHY, a well-known plumber of Springfield, Mass., has opened a plumbing and tinning establishment at 138 Dwight street.

CHARLES SCOTT is going into the tin and plumbing business at Benson, Vt.

WM. MATHEWS & SONS have formed a partnership to conduct the plumbing and tinning business at Lebanon, Pa.

THE FIRM of G. W. Hazel & Co. have dissolved by mutual consent, and the G. W. Hazel Company have been incorporated to continue the stove, furnace, plumbing and tinning business at the old stand, 11 and 13 Church street, New Haven, Conn. The company have a capital of $15,000, which is held by Wm. H. Hazel, Julietta D. Hazel and Frances D. Hazel.

THE ARTICLES incorporating the Rock Island Heating & Plumbing Company have been filed in the recorder's office at Rock Island, Ill. The capital stock is $10,000, and the incorporators are T. F. Burke, John Joers and Ernest Wagner.

GEORGE LEONARD is going to move his plumbing shop to the corner of Second and Joliet streets, La Salle, Ill.

WILLIAM ROSE is about to open a plumbing shop at 3620 Jacob street, Wheeling, W. Va.

WILLIAMS & Co., 90 Ann street, New York, make a specialty of soapstone for every purpose, griddles, foot warmers and open stoves, and have a large trade in laundry tubs and sinks and wainscoting with the plumbers throughout the country.

DU BOIS & DARROW are a new house with an office and sample room at 61 Gold street, New York. They will make a specialty of plumbers', steam and gas fitters' materials.

SECRETARY MCNAB of Paterson, N. J., informs us that the Master Plumbers of Paterson and Passaic are now members of the National Association.

WE ARE INDEBTED to Charles Millar & Sons, Utica, N. Y., for a copy of their handsome catalogue for the year 1894. This volume is a substantial publication, bound in stiff boards and contains over 230 pages. The frontispiece is a handsome engraved portrait of Charles Millar, who was born in 1808 and died in 1890. In an introductory notice to the trade they state that they are largely interested in and are the exclusive selling agents for the Utica Pipe Foundry Company and are prepared to furnish all material for the construction of new water works or the extension and improvement of old ones. They also refer to the excellence of their lead pipe, as well as their solder, tin pipe and tubing. They act as agents for various manufacturers of patented and staple goods and have large warehouses with full stocks. The following condensed index indicates the extensive line of goods made and handled by this well-known supply house: Wrought iron pipe and fittings, iron cocks, iron body valves, steam brass work, engineers' supplies, plumbers' brass work, plumbers' copper work, lead traps, plumbers' earthenware, marble slabs, water closet apparatus, plumbers' iron work, pumps, cast iron soil pipe and fittings, vitrified sewer pipe, corrugated conductor pipe, ventilating or leader pipe, hose, belting and packing, steam heating, gas fixtures and fittings, tools, lead pipe and metals, cast iron water pipe and fittings. All of the goods are illustrated, descriptive particulars being given where necessary, and in all cases full lists of sizes and prices. A very attractive feature of the book is the light green tinted paper that is used.

THE EDITION of the illustrated catalogue of the Haydenville Mfg. Company, 73 Beekman street, New York, issued this year, is probably the largest ever issued by a plumbers' supply house. Between 25,000 and 30,000 copies have been put in circulation.

SANDS & HOULE opened their new plumbing establishment and hardware store in the Goodwin Block, on Main street, Biddeford, Maine, last Saturday.

B. & H. H. SOMMER are arranging a fine line of plumbers' marble and sanitary ware at their new showrooms, 50 Cliff street, New York. They import Italian marble and English water closets, lavatories, Yorkshire laundry tubs and white porcelain sinks, tubs and lavatories and iron enameled roll rim baths. Pink Knoxville and Tennessee marble, as marble for floors and walls, in addition to plumbers' slabs, are a specialty.

BENTON R. DIBBLE AND CLINTON HURLBURT have opened a plumbing establishment in Winsted, Conn.

ROBERTS & SIMMONS is a new plumbing firm just opened for business in the Eitlegeorge row, 18 La Salle street, Aurora, Ill.

W. H. HITCHCOCK has added a stock of tinware to his stove and plumbing business on Central street, Palmer, Mass.

STOVE TRADE NOTES.

The New England Stove Trade.

Trade in New England is barely holding its own. As was expected, the first quarter of 1894 compares unfavorably with the same period of the previous year, although the net falling off is not so great as was feared. Most of the Eastern manufacturers are busy preparing new goods, but these will not be made in any great quantity until the season is further advanced and the probable demand can be more accurately gauged. Jobbers report a fair amount of business, particularly in gasoline stoves and refrigerators. The former are selling in much larger quantities in this territory than ever before, but the demand for the latter is not so great as last season. Sample orders so far constitute the bulk of the trade. The repair trade is between seasons and a light business is doing in this line. Reports of collections are rather conflicting, but generally speaking there is no improvement and possibly a slight decrease ; however, hand to mouth buying naturally favors better collections, as small bills are paid more promptly than large ones. The furnace trade is dull and the prospects are rather uncertain, although a fair demand is expected.

The outlook for building in this vicinity as regards smaller houses is not particularly promising. Speculative builders who in former years have erected a large number of low cost houses and disposed of them to parties of moderate means, accepting a few hundreds of dollars in cash and taking mortgages for the balance, find that owing to the hard times it is almost impossible to make sales to this class of people, and the fact that a number of those disposed of last season have come back on their hands through the inability of the purchaser to continue his payments is resulting in more conservatism among the builders. Larger work, however, such as school houses and other public buildings, bids fair to be active during the spring and summer. Many towns and cities throughout New England are making liberal appropriations for public works, and from this source the steam and hot water men expect to derive considerable business.

Taking the several branches of the trade together, and considering the general state of things, there is really little room for complaint. Of course, business is unsatisfactory, but that is true of almost every line, and it does not appear that the New England stove trade is feeling more than its natural share of the existing depression.

New Trade-Mark.

The Western Stove Mfg. Company, St. Louis, have adopted a new trade-mark, which we illustrate herewith. The center of the trade mark represents an apple with a short stem and leaves attached and surrounded by rays. The name and address of the firm, with an indication of the line of goods manufactured, appears on the side of the



Trade-Mark of the Western Stove Mfg. Company.

apple. The design is neat and attractive, and will doubtless meet the general approval of the trade.

St. Louis Stove Trade.

The stove trade at this time of the year is at about its lowest ebb, and in ordinarily good times it is difficult to market stoves, while now it is particularly so. Manufacturers, however, are living in hopes of better times, so much so that at least 80 per cent. of the producing capacity of the stove trade in this city is at present employed. Only one foundry is closed down, and that the smallest of the four located here. The other three are running nearly, if not quite, full. With the enterprise which characterizes the stove trade at large, the local foundries are at work on new goods, which will make their appearance in the course of the next two months. Reports from their traveling men indicate that the stock of stoves in retailers' hands was never before so light, and with any kind of improvement in the general commercial situation, no matter how slight, the stove trade will be quick to respond. It is pretty generally agreed that the sales of stoves during the year 1893 were from 25 per cent. to 30 per cent. less than the year immediately preceding, so that it seems reasonable to assume that those who postponed buying last year will be forced to become purchasers this year, even if unwilling ones. Many stoves were used last year which ordinarily would have been dispensed with, and they cannot possibly be made to do service again. It is a little too early to make any predictions regarding the volume of this year's business, but it is safe to assume that it will show material improvement in comparison with last year.

As regards gasoline stoves there is not much cause for complaint. The largest local manufacturer, and the largest perhaps in the country, informs us that their business at this writing is very close to last year, and the indications for a continuance of this activity are encouraging.

Albany Gossip.

Our Albany correspondent, writing early in the week, says : A visit to the manufacturing plant of the Perry Stove Company shows trade in this section to be reviving, and indicates the increase of hopeful features. The plant started up, after inventory and repairs, on February 5 and has been in operation ever since. The force of molders is the same as the number employed at the time when the concern shut down. The company have been largely engaged in manufacturing their popular lines of oil and lamp stoves, to which they have added one entirely new size, the Royal F, a four-burner stove, full nickeled, with large permanent extension top, having four full sized 8-inch boiler holes. The stove has met with great popularity. The Perry line of Royal lamp stoves has been greatly improved by the addition of a very convenient lighting device and the enlargement of the smaller size. This line is now furnished in polished nickel and is a very complete and serviceable assortment of oil goods. The Jockey is a new addition to their line of lamp goods, and is of medium price.

The Shoo Fly is also a new low priced line. The company are making two new lines of hot plate gas stoves — the Argand and Fire Fly. These are neatly finished in nickel and plain iron, are simple in construction and powerful in operation, possessing many special and useful features As a specialty the company have brought out a double oil stove mounted on polished nickel or a japanned base, with either two or four hole removable extension top. They have also made new and improved extension tops and furniture for their oil and lamp stove lines. The superintendent of the company, R. Z. Liddle, says that while their plant has been very busy with spring goods the general trade has not been up to the standard, but they believe they have had a large percentage of the sales in these lines and hope for improved

conditions. They are at work on some special improvements in ranges and parlor goods, which they will bring out later, and which, they believe, will meet with general favor.

Mason & Davis Company,

72–76 Lake street, Chicago, have just issued their catalogue for the season of 1894. The products of this company comprise wrought steel ranges, charcoal broilers, laundry stoves, gas ranges and hot air furnaces, all of which are put on the market under the brand "M. & D." The catalogue now being distributed is the largest thus far issued by the company. It consists of 76 pages, octavo, illustrated with engravings of more than usual excellence and bound with an olive colored paper cover. The first part of the catalogue deals with wrought steel ranges, adapted to the use of any kind of fuel. The ranges shown cover a great variety of styles, such as 4-hole and 6-hole family ranges with square tops and either high or low warming closets; the same with reservoirs at the side or with a galvanized iron tank on brackets; others with handsome sheet iron canopies and with broilers on brackets at the side; large ranges for restaurants and hotels, running from six holes up to as many as may be desired. The gas ranges are all built in cabinet style, the smaller ones having a single oven and four cooking holes, while larger ones are made with double oven and six holes. Several kinds of combination ranges are shown, in which half the range is for use with coal or wood, while the other half is equipped for gas. The M. & D. gas ranges have a number of special features, such as an elevated broiler, a swinging oven burner which can be drawn out for lighting, and water heaters which can be used at the same time for cooking purposes. The water heater is composed of seamless brass tubes, which heat quickly and are economical in the use of gas. The combination ranges are so built that water can be heated either on the gas range or the coal range side, either being always ready for use. These ranges have grown steadily in favor since they were first brought out as an experiment to see whether there would be a sufficient trade in them to warrant their regular manufacture. A charcoal boiler is a separate article of manufacture. Laundry stoves of several styles are shown. The M. & D. furnace is intended for either hard or soft coal, is made with a dome of steel plate, and is fitted with a circular cast iron radiating section around the fire pot, which acts as a return flue and radiates the heat that remains after leaving the body of the furnace. It is made in four sizes. The catalogue closes with several pages of illustrations of repairs for all kinds of M. & D. ranges.

ODD PLATES.

The Baxter Stove Company of Mansfield, Ohio, state that the fire which on April 5 destroyed a portion of their storage warehouse, causing considerable damage to the building and to their stock of Banner coal and wood stoves, did not affect the operating department, nor did the fire reach their stock of Monarch vapor and gas stoves. No delay, therefore, will be caused in the filling of orders for these goods, as the company will continue running without intermission, and orders placed with them for either Banner or Monarch stoves will be promptly shipped. The fire was caused by an explosion in the japanning department, but the loss is fully covered by insurance. In a circular letter which the company have issued under recent date, they say they are prepared to offer a large discount on such Banner cooks and heaters as were damaged by water and on which a large force of men is at work cleaning and restoring them to a marketable condition.

Eugene Munsell & Co., 218 Water street, New York, are remodeling the back part of their premises used for general office purposes. The entire portion heretofore used for clerical work has been torn out and replaced with narrow ash boards, running up two stories and covered with a glass roof. The wood work will be finished in natural color. This rearrangement will insure plenty of light and good ventilation.

The Marion Stove Company of Marion, Ind., invite the attention of dealers to their Retort self-feeding stove, adapted for using any kind of soft coal as a fuel. The heater is made in two sizes, Nos. 16 and 18, embodies the modern features and is ornamented in a neat and attractive manner.

Barstow Stove Company, corner of Beekman and Water streets, New York, are the special agents for Jewel gasoline stoves made by George M. Clark & Co., Chicago, Ill. The line covers a large assortment of process and cabinet ranges, step, medium and junior medium stoves, junior safety and Jewel-Acme medium and safety stoves, Jewel ranges and picnic stoves, &c.

The Simonds Mfg. Company, 50 Cliff street, New York, have made their sample room very attractive. The walls are decorated with their register faces in various designs, white and black enameled and electro plated in brass, copper and oxidized, artistically arranged to secure good effect. Their line of hot air furnaces are finished in white and gilt, and their ranges with a deep black polish make a very pleasing contrast. A new catalogue of their goods soon to be ready for distribution is said to be very handsome, and may well be preserved as a souvenir.

Eugene Munsell & Co , 218 Water street, New York, have issued an illustrated price-list of gas stoves and ranges for this season's trade. Among the goods referred to is a line of Favorite Manhattan gas ranges, with two, three and four top burners, and with or with out hot water heater. They also direct attention to an improved method of mounting kitchen boilers for circulating hot water, in connection with combination coal and gas ranges, so located as to economize kitchen space. It is known as the Graves Ronalds boiler, and in itself resembles the usual upright pattern. It is supported by a cast iron shelf about 2 feet above the top of the range at either the right or left hand corner, projecting about one-third the diameter of the boiler beyond the range. From the floor to the top of the boiler is from 76 to 80 inches, depending on capacities of 18, 24, 30, 34 and 40 gallons. Hot water is drawn from a faucet placed at the lower water back connection.

W. M. Crane & Co , 838 Broadway, New York, have enlarged their capacity for doing business by adding an annex in the rear of their present quarters in size 25 x 30 feet, which they hope to occupy before May 1.

George Starrett, 227 and 229 Water street, New York, has been appointed Eastern agent for the ranges manufactured by the Electric Oil Stove Company, Homer, Mich. These ranges are made in both two and four hole sizes, in a number of styles with and without open work, warming attachments at back and sides. The top is of cast iron, with black enameled and ornamented steel frames, fitted with casters. A long horizontal round tank, holding 1 or 2 gallons of kerosene oil, according to size, feeds the lamps, which with the tank are supported upon a sliding shelf, which can be drawn forward for filling or trimming. The central draft brass burners are supplied with 10-inch round extra heavy wicks, giving an intense heat with no perceptible odor. The covers or lids are 8 inches in diameter, with 4 inch removable center lids, convenient for heating cups, teapots and other small utensils. The lamps have mica fronts, and in the tank is a float to indicate the volume of oil.

Henry Gleason, 106 Beekman street, New York, has just returned from a tour of the Western stove foundries, covering a period of about three weeks. The principal object of the trip was to inform himself concerning what is latest and best in independent gas stove connections, embracing cocks, pipes, nipples, caps, air mixers, &c. He has recently taken the selling agency of Simpson Fry Mfg. Company of Brooklyn, N. Y. This is in addition to the following lines, for which he has long been agent: New Jersey Lamp & Bronze Works, stove urns and bronze figures; Trent Tile Company, stove tiles, and Matthews Mfg. Company, stove knobs, hinge pins, &c.

J. H. Cort & Son, 220 and 222 Water street, New York, manufacturers of and dealers in cooking and heating apparatus, are about to vacate the premises so long occupied by them at the corner of Water and Beekman streets, and move to their factory in Brooklyn, corner Adams and Water streets. They will make a specialty hereafter of manufacturing exclusively such goods as gas ranges and oil heaters.

The Tracy Gas Stove & Furnace Company of East St. Louis, Ill., have recently been incorporated, with a capital of $50,000. The incorporators are: L. J. Tracy, Theodore Hebus and Charles Elam.

The Bain Stove Company, Charleston, Ill., was recently sold to the Charleston Building & Loan Association for $13,000. It is intimated that people in Charleston will operate the works.

E. B. Colby & Co., 237 Water street, New York, have been appointed Eastern agents for the Cable and Cable, Jr., oil stoves. These are made in one, two and three wick styles, with cast iron oil tanks, at prices very close, they say, to those made of tin. The Junior pattern for gasoline is made in one, two and three burner styles. The feature of this construction, as stated by the agents, is that the tank must be lifted off to fill it, closing automatically as this is done. When filled it must be put properly in place, when the connection opens automatically. This prevents filling while attached to a lighted stove, as the stove will burn full 10 minutes after the tank has been removed. They are also offering as agents a full line of the Gurney refrigerators, made by the Gurney Refrigerator Company, Fond Du Lac, Wis. One

of the characteristics of these refrigerators is the removable patented galvanized ice compartment, which can be instantly lifted out for cleaning. At the left is also a cast iron tank within the compartment, porcelain lined, for refrigerating drinking water, to be drawn at will through a faucet, the water being cooled by the proximity of the ice.

W. M. Crane & Co., 838 Broadway, New York, manufacturers of and dealers in hotel, *café* and restaurant gas appliances for cooking and heating purposes, are continually bringing out novelties in this line adapted to public or private use. They recently got up to order for D. B. Wesson, Springfield, Mass., the well-known pistol manufacturer, an elaborate laundry stove to heat six irons separately, having a capacity equal to the needs of a family of ten people. A copper boiler wss placed in the center, and the entire apparatus handsomely nickeled. One of the several departments of their business is the fitting up of banks, trust and insurance companies, exchanges, &c., who provide their employees with a warm noonday meal, with gas cooking outfits. Among those put in recently in this city are the Fourth National Bank, Farmers' Loan & Trust Company and Bank of the Metropolis, some of whom provide for upward of 100 people. This company have just completed a series of experiments in connection with a gas furnace for heating an entire house. These will be offered as a substitute for coal furnaces, necessitating no alterations in flues, registers, &c.

Fletcher, Russell & Co., Limited, Thynne street, Warrington, England, favor us with a copy of their catalogue for March relating to gas heating appliances. In its general make up it resembles previous editions brought out by the company, is profusely illustrated, and clearly indicates the line of specialties manufactured. Attention is invited to their Standard high power concentric ring burners, which are suitable for furnaces and for use under vessels of large diameter. They are made separate and independent of each other, or four burners can be fastened together and used as one. Mention is also made of their triple concentric burners, $8\frac{1}{2}$ inches in extreme diameter and consisting of three burners in one casting. A great deal of interesting matter relative to gas cook stoves and heaters is given, and while the catalogue is issued for circulation among the English trade, it contains many things likely to interest dealers on this side of the water.

Dispatches from Reading, Pa., are to the effect that the trouble recently referred to as existing among the mounters at the works of Orr, Painter & Co. is practically at an end. Some of the mounters have returned to work, and at the time the dispatches were sent it was thought everything would be settled in a few days. All the other departments are in full operation, and it is intimated that the Milmont plant will be running full in the not very distant future.

The Gobeille Pattern Company of Cleveland, Ohio, are distributing an advertising novelty which is decidedly unique in its way. It consists of a piece of white pine 4 inches square and $\frac{3}{16}$ inch thick, planed perfectly smooth and bearing upon one side a postage stamp and the name of the addressee, while on the other side is the printed matter, which appears in colored ink. In the upper right hand corner is a *fac simile* of the company's trade-mark, and in the opposite corner are the words "Inside Information," and below them in parenthesis, "On the Square." The body of this wooden postal card is occupied with the following: "Do you know that when business starts up there will be a lot of new goods on the market and the old styles will not go? The best concerns are quietly adding to their line either entirely new or freshly decorated patterns. A word to the wise is sufficient." This is signed with the name and address of the company.

Giblin & Co. of Utica, N. Y., have issued from the press a very neat catalogue, oblong in its general shape and bound in colored paper covers, illustrating and describing the furnaces which they manufacture. These include the Standard Rival, Standard Junior, Standard Smokeless, Rival Junior and Smokeless, some of which are combination heaters. The goods are carefully illustrated and fully described, the matter being arranged in a way to prove interesting and instructive to the dealer.

The Michigan Vapor Stove Company of Grand Rapids, Mich., have issued a very pretty catalogue for 1894. Their line of stoves comprises steel frame single and individual generators, consisting of three-burner with step, two-burner with step, two and three burner square top, two and three burner high juniors, and two and three burner juniors. A peculiar feature of these stoves is their equipment with a tank which can be taken off for refilling. This enables it to be taken out of doors to be refilled, so that no gasoline whatever is exposed in the house. The burners used on the step stoves are of a special pattern, denominated jet cone burners, which divide the flame into a large number of jets, thus distributing the heat evenly over an extended surface. Full repairs are furnished for all stoves. The catalogue also treats of stove furniture in considerable detail.

The Howard Furnace Company of 210 Water street, New York, have lately completed the contract for heating the Fourth Avenue M. E. Church, corner Fourth avenue and Forty-seventh street, Brooklyn, using two of their largest size combination furnaces with hot water radiators in each of the classrooms of the Sabbath school building, also in the church audience room, together with the lecture room, ladies' parlor and pastor's study. The company have also put in a number of other combination furnaces in private dwellings and have just completed a dwelling for a prominent architect of Philadelphia. They also placed one of their combination furnaces in King's Hotel, Amityville, L. I., in the early part of the winter. They have received very flattering commendations of the same for the efficiency of the work in extreme cold weather. The company now have under contract a school house on Long Island.

A. Weiskittel & Son, Baltimore, Md., favor us with a very neat card having a gilt border and embellished with illustrations of a Fire King cabinet gas range and a Fire King table stove. The printing is in two colors, forming a pleasing contrast and giving a rather rich effect. There are illustrations of the new Fire King gas burner noticed in these columns a week or two since. In the lower left hsnd corner of the card is a *fac-simile* of the firm's trade-mark, while at the right appear their name and address. The opposite side of the card carries a number of reasons why gas should be used for a fuel.

S. S. Jewett & Co. have removed their office and salesroom from 38 and 40 Lake street to 2050 Grove street, Chicago, occupying for that purpose a portion of their new warehouse. Its location is at the south end of the Canal street bridge over the south branch of the Chicago River.

The Fuller Warren Company's Chicago headquarters will be removed on May 1 from 48 and 50 Lake street to 147 and 149 on the same street.

Cribben & Sexton, 75 and 77 Lake street, Chicago, will remove their office and salesroom to their new building at 50 to 53 Erie street, May 1.

Charles F. Bartlett, Tenth and Filbert streets, Philadelphia, Pa., issues a circular of liberal proportions, the object of which is to bring his name and business prominently before the mind of the dealer when in need of anything in the way of heaters, ranges and open grates. Mr. Bartlett has been engaged in the business indicated for nearly half a century, and states that his workmen are only those who have had experience in the making of goods of this kind. The circular illustrates and describes the Tobasco, a new and improved portaable furnace with shaking and dumping grate, the London Café wrought steel portable range, made with single or double oven, the London Kitchener, suitable for private families or public institutions, the London Café wrought steel gas ranges, the Vesper open fire place, the Perfection gas grate and the Veteran and Bartlett furnaces. One side of the circular is devoted to a list of names and addresses of some of the people in Philadelphia and vicinity who are using Bartlett ranges and furnaces.

John D. Rise, formerly cashier of the Lebanon Trust and Safe Deposit Bank, has recently been appointed the financial manager of the Lebanon Stove Works of Lebanon, Pa. Mr. Rise took charge of the affairs connected with his new position on Monday, April 9. He was appointed to succeed J. M. Reilly, whose resignation was referred to in these columns a short time since.

Walker & Pratt Mfg. Company's foundries, at Watertown, Mass., commenced this week to run four days out of six, instead of shutting down altogether, as was contemplated.

The Wm. G. Fischer Mfg. Company of Kokomo, Ind., have brought out a new four-hole wrought range, which they have christened the No. 248 Columbian. The American shield appears on the oven door, the corner pieces are decorated with stars and stripes and an outstretched eagle surrounded with stars appears on the feed door. The manufacturers, therefore, allude to it as "the banner range of 1894." It is well made, having a drop oven door, patent drop feed door, triangular grate, gravity latch, nickeled front guard rail, high shelf, flues lined with heavy sheet asbestos protected between two sheets of steel, and the body made with round corners closely and substantially riveted. The oven is so made that it is claimed to be proof against dust, ashes, smoke or gas. This range is made for soft or hard coal, coke, wood or natural gas.

A most excellent advertising scheme has been devised by the Michigan Stove Company. They furnish to any hotel keeper a full set of dating stickers, covering every day from now until the end of the year, to be used on his register of guests. They are printed in

carmine, are very neat in appearance, give the day of the week as well as the full date, and thus cause the date to stand out prominently on the page. Each sticker is 7 inches long by ¾ inch wide, printed on perforated paper so as to be easily torn from the sheet and gummed for instant use. The sole suggestion of the Michigan Stove Company's connection with the date line is their Garland trade mark in the center, but it is of modest proportions and rather ornamental.

THE GIRARD STOVE & FOUNDRY COMPANY of Girard, Ohio, contemplate the erection of a larger building, and there is some discussion of the advisability of removing to another locality. Youngstown has hopes that in such an event the advantages of that point will not be overlooked.

THE WORKS of the Mississippi Valley Stove Company, at Fulton, Ill., have been completed, and manufacturing operations will begin very shortly. This concern is the transplanted Ohio Stove Company, formerly of Tiffin, Ohio.

Decline of the Brick Set Furnace.

BY A. W. GLESSNER,

President Excelsior Steel Furnace Company, Chicago.

A feature of the furnace business of to-day that has received a good deal of attention at the hands of the trade is the decreasing demand for the brick set furnace in favor of the portable furnace. In some sections of the East, and particularly in some of the larger cities of Ohio and Pennsylvania, the brick set furnace is still being put in in considerable numbers, but throughout the larger portion of the country at the present time, and particularly in the large and growing cities of the West and middle West the brick set furnace is becoming almost as rare as the buffalo. The brick set furnace has done a great work in its day, but the requirements of modern dwellings are such as to make it an undesirable fixture in the basement of the city dwelling of to-day.

Undoubtedly at the time when the brick set furnace first came into popularity this style of furnace was much more economical in its consumption of fuel than was the portable form of furnace, for the reason that then the improved casings and bonnets now in use had not come into use, and a large proportion of the heat generated by the portable furnace was practically lost.

Furthermore, there has come a decided change in the uses to which the modern basement is put. A large portion of the dwellings erected at the present time in towns and cities are supplied with water systems as well as plumbing and drainage systems and the pipes pass up through the basement, and in not a few cases, where brick set furnaces had been installed in houses before the introduction of water or drainage service, it was found that after the service had been introduced there was great liability of freeze ups. There should be sufficient warmth in the basement during the most severe winter weather to prevent the freezing of the pipes; and whereas a brick set furnace might, and undoubtedly would, effect a very slight saving of fuel over the portable form, this economy of fuel will be more than counterbalanced by the loss, annoyance and damage caused by a single freeze up in the course of a winter. I know of one manufacturer of furnaces who formerly made brick set furnaces in large numbers, who has not had his patterns for them in the sand for the last two years. The tendency to abandon the brick set furnace seems to be a good one, and not only does the portable furnace supply in every respect the requirements of the modern dwelling, but it does so at a considerably lower price.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

WM. G. MCLEOD of Cambridge, Mass., will erect a four-story apartment house of twelve suits of rooms, each to have a bathroom and an independent system of heating.

MAY & HARRIMAN, plumbers, were the lowest bidders for the work of equipping the water closets in the court house at Anderson, Ind. They will put in ten closets and eight urinals for $913, and make all connections with the sewer.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until May 2, for work including low pressure steam heating and mechanical ventilating apparatus for the United States Court House and Post Office building at Paris, Texas. Drawings and specifications can be had from the Supervising Architect, Washington, or from the superintendent at Paris.

BIDS will be received by the School Board of Defiance, Ohio, up to April 20, for heating and ventilating the new six room school building in the Third Ward. Bids for both hot air and hot water will be received.

PROPOSALS will be received up to April 21 for the plumbing and hot water heating plant in the new City Hall at San Francisco, Cal.

THE Q. N. EVANS CONSTRUCTION COMPANY, 41 Dey street, New York, have been awarded the contract for heating and ventilating the Gibson district school house at Boston, Mass. A steam plant on the blower system will be installed, at a cost of $12,523.

PROPOSALS will be received until May 1 for heating the Bellefield and Soho schools at Pittsburgh, Pa., with a steam or hot water plant.

THE J. L. MOTT IRON WORKS, 311 and 313 Wabash avenue, Chicago, are shipping a large number of bathtubs, water closets, lavatories, slop sinks, &c., to the new St. Nicholas Hotel, St. Louis.

THE WELLS & NEWTON COMPANY, 274 Dearborn street, Chicago, have secured the plumbing contracts for the stations of the Metropolitan Elevated Railroad at Halsted street, Center avenue, Laughlin street and Marshfield avenue.

THE JOHN DAVIS COMPANY, 69 to 79 Michigan street, Chicago, have contracts for steam heating in the flat building of John Fiske, Forty-seventh street and Champlain avenue; station of the Lake Street Elevated Railroad at Rockwell street, and W. H. Purcell's buildings at Kensington, Ill.

THE HERENDEEN MFG. COMPANY, 131 Lake street, Chicago, have received an order from the Sanitary Heating & Plumbing Company of Peoria for three No. 9 Furman hot water boilers, to be placed in school buildings at Rushville, Ill.

JACOB G. WEBER, 244 North Clark street, Chicago, has the contract for plumbing in the apartment building of Richard F. Teale, Monroe street and Ogden avenue.

THE WINDSOR HEATER COMPANY of Galena, Ill., have secured the contract for heating the almshouse in that county. The contract is an important one, as both the main hospital building and the large asylum are to be heated. The company manufacture both steam and hot water heaters.

THE CONTRACT for the plumbing in the mansion of Charles Miller, at Nazareth, Pa., has been awarded to Fred. J. Rice of Bethlehem.

THE S. WILKS MFG. COMPANY, 113–123 Clinton street, Chicago, are to furnish one of the largest sized Wilks heaters, 42 x 48 inches, and a steel tank of 1500 gallons capacity, for the St. Benedict apartment building, Rush street and Chicago avenue. Also two large steel tanks and a 36 x 48 inch Wilks heater for I. C. Gifford's apartment building, Rhodes avenue and Thirty-third street. The firm have also received orders for four Wilks heaters from New York City, and two from San Francisco.

ARCHITECTS MURPHY & CAMP, Chicago, have designed for John Cashin a three-story apartment house to be built on Prairie avenue, between Forty-fifth and Forty-sixth streets. It is to be heated by steam.

ARCHITECT ALFRED SMITH, Chicago, has planned for H. Wolf a two story, attic and basement residence, to be erected at 375 Ashland avenue. The interior will be finished in hardwood and heated by hot water.

ARCHITECT R C. BERLIN, Chicago, has designed for James A. Davidson a two-story, attic and basement residence, to be built at 953 Jackson Boulevard. Furnace heat will be used.

ARCHITECT H. S. JAFFRAY, Chicago, has designed for W. R. Cowan a three-story apartment house, to be erected at Forest avenue, near Thirty-fifth street. It will be heated by means of a furnace.

ARCHITECT J. M. HOBKINS, Chicago, has made drawings for a suburban residence for O. L. Baily, to be erected at Oak Park, Ill. It will be frame on stone foundation, and provided with gas grates and combination heat.

ARCHITECTS FLANDERS & ZIMMERMAN, Chicago, have designed for J. Van Craenenbrock a three story apartment house, to be built at the corner of Fifty-fifth street and Monroe avenue. The interior will be divided into five stores and ten apartments, and will be heated by steam.

ARCHITECT J. H. MCELDORONEY, Chicago, has prepared plans and specifications for a fine residence to be built at Chicago Heights. Steam heat will be used.

ARCHITECT H. R. WILSON, Chicago, has designed for James M. Smith a three-story residence, to be built on Lexington avenue, near Fifty-first street. The interior will be finished in hard wood and heated by hot water.

KEHM & MERTZ, 289 East Kinzie street, Chicago, are to install a steam heating plant in the Woodlawn School, Lexington avenue, near Sixty-fourth street. The building contains 20 rooms and assembly hall.

TRADE REPORT.

The Iron Market.

In the Foundry Iron trade Philadelphia reports a good deal of activity, buyers having taken hold at the temptingly low offers made. Along the seaboard and in New England the unsettled condition of freights in Southern Iron leaves the situation in a mixed condition. It is pretty plainly intimated that very low rates are to rule and that prices of Pig Iron will be correspondingly cut. In the West buyers are hesitating about placing orders for Southern Iron, the feeling evidently prevailing that the recent concessions in freight rates have not yet reached the bottom.

Careful observers, while acknowledging that no early rise of any consequence is likely, do express the opinion that purchases at present prices are safe.

The renewal of troubles in the Connellsville coke region was a contingency which many in the trade have kept in view.

Pig Iron.—There has been a sharp cut in freight rates to interior New England points. Yet it is pretty plainly intimated by the railroad companies that special rates are simply a matter of negotiation. The result is that the market in New York and in New England is unsettled until it is definitely known what can be done. Sellers are practically giving awsy the whole of the advantage thus secured. Low prices have been made by Schuylkill Valley furnaces in New England. We note a sale of 1000 tons of Swedish Pig at private terms. We quote standard brands $12 50 @ $13.25 for No. 1; $11.75 @ $12.25 for No. 2; at tidewater. Southern Iron, same delivery, $12 @ $12.75 for No. 1; $11 @ $11.50 for No. 2; $10.75 @ $11.25 for No. 3; $11 @ $11.25 for No. 2 Soft, and $11.25 @ $11.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.25 @ $10.75.

The volume of business in Pig Iron in the Philadelphia market has been considerably larger during the past few days, and while prices are lower holders feel very much encouraged by the liberal acceptances from leading consumers. Recently bids have been made and accepted for 500, 1000 and 3000 ton lots, with requests for options on additional quantities, all of which confirms the impression that business is improving. Besides this, other negotiations are fairly under way which promise to clean up all the odds and ends, or anything that is offered at attractive prices. Prices have been extremely low, lower than our inside quotations, but to get things moving holders were not inclined to stick at 25¢ a ton when the quantity was large enough to make it an object. There is an impression that very heavy cuts in freights are pending, and that, in fact, some of the sales just closed could not have been possible unless special arrangements of this kind had been made to enable the sellers to get out whole. What the exact figures are it is impossible to say, but they are understood to be much lower than ordinary quotations. General quotations for Philadelphia deliveries are about as follows, and from 25¢ to 40¢ less at interior points, such as Harrisburg and vicinity:

Standard No. 1 Foundry X	$12 50	@	$13.00
Standard No. 2 Foundry X	11.75	@	12.25
No. 2 Plain	10.75	@	11.00
No. 1 Soft	11.00	@	11.50
No. 2 Soft	10.50	@	10.75

Transactions for the week in the Chicago Pig Iron market have not been up to the average for the preceding four or five weeks. Local furnaces have taken the greater part of the business, such as it was. Southern sellers have done somewhat better in the country districts than in the city, but their sales have seldom exceeded 100-ton lots. The influence of the heavy reduction in freight rates from the South is felt unfavorably. Although the price of Northern as well as Southern Iron is now much lower than anything before known in this locality, yet buyers appear to have no confidence that values have actually touched bottom. They are disposed to wait for further developments and are apprehensive of changes in freight rates in other directions. Transactions are therefore confined to actual requirements in all kinds of Iron. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00	@	$15.50
Local Coke Foundry, No. 1	11.25	@	11.50
Local Coke Foundry, No. 2	10.50	@	11.00
Local Coke Foundry, No. 3	10.00	@	10 50
Local Scotch	11.50	@	11.75
Ohio Strong Softeners No. 1	13.00	@	14.00
Southern Silvery, No. 1	.....	@	11.50
Southern Silvery, No. 2	.....	@	11.00
Southern Coke, No. 2	10.00	@	10.35
Southern Coke, No. 3	9.75	@	10.00
Southern, No. 1, Soft	10.25	@	10.50
Southern, No. 2, Soft	9.75	@	10.00
Tennessee Charcoal, No. 1	15.00	@	15.50
Tennessee Charcoal, No. 2	14.50	@	15.00
Alabama Car Wheel	17.85	@	18.00
Jackson County Silvery	15.00	@	16.00
Other Ohio Silvery	13.00	@	13.50

In the Pittsburgh district some large sales of Bessemer Pig Iron have been negotiated. The short supply of Coke, owing to the Connellsville strike, is already having effect in the stoppage of furnaces. For the first time in some weeks there have been some good sales of Foundry Iron, but at the lowest prices touched. We are advised of a sale of 500 tons of No. 1 Foundry at a price equal to about $11, Pittsburgh, and one of 500 tons of No. 3 Foundry at a price equal to about $9 75, Pittsburgh. None of this Iron comes to Pittsburgh. Quotations are as follows:

No. 1 Foundry	$11.00	@	$11.25 Cash.
No. 2 Foundry	10.25	@	10.50 "
No. 3 Foundry	9.75	@	10.00 "

Metal Market.

Pig Tin.—Prices have moved about somewhat feverishly, but the extreme range covered was only about 30¢. The fluctuations were due in a great measure to the ups and downs of the London market. In other words, purely local conditions have had very little influence, if any, in shaping the course of values. The fact that London has a large stock on the spot and an unusual quantity afloat offsets all calculations of supplies, consumption, &c., on this side of the Atlantic, since it is uncertain when or to what extent Tin may be shipped from Europe to the American market. During the early part of the week under review some spot stock was sold at as low as 19.30¢. Subsequently 19.60¢ was paid in remote instances. Directly afterward 15 tons were sold on 'Change at 19.50¢ for prompt delivery, and 15 tons at 19 65¢ for June delivery. At the close the market softened somewhat under the influence of lower London quotations, but 19.50¢ net cash appeared to have been bottom rate for 5-ton lots, prompt delivery. Consumption is of about the same character and volume as it has been for some time past. It is still somewhat below the average for this season of the year. Small lots of Straits Pig from store are quoted at 21¢ @ 21¼¢ ℔ lb.

Copper.—The market for Ingot has remained quiet. At all events, none but very commonplace transactions have been reported, and the demand is represented as being quite as tame as it has been at any previous time during the past month or six weeks. Such as it is, however, the business passing is at practically former prices, and the market retains fairly steady tone despite the spiritless state of business. Lake Superior Ingot is quoted at 9¼¢, prompt or future delivery. Electrolytic remains at 9¼¢ @ 9⅜¢, and over 9¢ @ 9¼¢ is the exception on casting stock. For small retail quantities an advance of about 1¢ ℔ lb is the rule. The demand from consumers for both Ingot and Sheet Copper continues flat and disappointing. Exports from the United

States during the eight months ending February 28, as per statement of the Bureau of Statistics, were as follows:

Ore—	1894. Tons.	1893. Tons.
To United Kingdom....	21,959	26,708
To Germany.....	1,016	78
To other Europe	none	none
Totals.....	22,975	26,786
Ingots, bars and old—	1894. Lbs.	1893. Lbs.
To United Kingdom. ..	47,523,643	1,969,117
To Germany.....	18,160,862	2,260,306
To France..... ..	24,119,007	7,063,067
To other Europe.	50,601,917	6,605,578
To other countries.....	508,461	57,787
Totals.....	140,913,890	17,955,875

Pig Lead.—The destruction of the concentrator, ore houses and works of the Horn Silver Company, cutting off, as it did, a source of considerable supply and a free selling agency, caused heavy buying of the Metal. Nearly or quite 1500 tons changed hands at prices ranging from 3.37½¢ up to 3.45¢. Subsequently single carloads realized 3.47½¢. At this writing sellers are asking 3.45¢ @ 3.50¢. It is considered doubtful that the company will resume work within the next six months, and a firm market for Lead is therefore anticipated should the demand be normal. The Horn Silver mine production was about 600 tons ℔ month. A little more jobbing business was reported during the week, retail prices being firm at former quotations. Manufactured Lead remains dull.

Spelter.—Smelters who became tired of waiting for a better market dropped their prices suddenly a few days ago and the entire market became demoralized, with ordinary Western brands freely offered at 3.60¢ @ 3.62½¢, delivered here or at common point. As yet it does not appear that the lower cost has prompted freer buying by Eastern consumers and the market seems to be quite as flat as it was before the break took place. Since our last report 14 Western furnaces have closed down, making a total of 74 furnaces now idle, which were running at this time last year. It is reported that prices were forced down to compel these furnaces to close, and that lower prices are possible unless additional furnaces are added to the list of idle ones. The consumptive demand continues strictly moderate, and prices for small lots firm at 1¼¢ ℔ lb.

Antimony.—Dealings are moderate, and the market is barely steady, with 8¾¢ @ 9¢ quoted for Hallett's and 10¢ @ 10½¢ for Cookson's.

Nickel.—The market remains quiet, and 40¢ is still quoted as seller's price.

Tin Plates.—In the earlier part of the week a very fair business was done in spot goods, chiefly in the shape of moderate sized lots for immediate delivery. Some few sales of large parcels, for both spot and future shipment, have also been made; the latter including some good sized orders for ordinary Bessemer Cokes for May and June delivery. The prices were, however, understood to be down to the level of the lowest current quotations. Forward shipments, nevertheless, do not command the interest usual at this time of the year, and the market is somewhat disappointing. The better movement was hardly maintained toward the latter part of the week. Prices are still rather uneven, with a slight leaning in buyers' favor, particularly for spot goods.

A special cable dispatch to *The Iron Age* from London, dated April 11, reports dullness in the British Tin Plate market. Small orders for Cokes are more plentiful at bottom rates, but the total is small. Sellers are cautious regarding forward contracts, owing to probability of stoppage of more works, possible labor troubles and belief that prices have reached lowest point. Stocks at Swansea about 287,000 boxes. Liverpool quotations for Plates were as follows:

IC Charcoal, Alloway grade.....12/ @ 12/6
IC Bessemer Steel, Coke finish. ...11/3 @ 11/6
IC Siemens " " " .....11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20.....Nominal.
Charcoal Terne. Dean grade.....10/3 @ 10/6

Sheet Iron.—Black Iron is exceedingly dull. Except in the case of light Sheets for tinning puposes the jobbing trade in this material is at a standstill, and prices are demoralized. Although quotations are brought down to the lowest prices yet made, these can readily be shaded on desirable orders. Galvanized Iron is in slightly better shape, owing to some increase of movement in the building trades, and prices are more firmly maintained.

Chicago Report.

Scrap.—Old Material continues neglected. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap.....	$7.00	....
Machinery Cast.....	6.00	....
Malleable Cast.....	5.00	....
Stove Plate (free of burnt)..	4.00	....
Burnt Iron and Grate Bars..	3.00	....
Sheet Iron and Hoops.. .	2.00	....
Plow Steel and Breaking Stock.....	4.00	....
No. 2, such as Shovels, Hoes, &c.....	3.00	....
Old Boilers—whole (Iron)....	3.00	....
" (Iron)—cut in single Sheets and Rings..	5.00	....
Old Gas-Pipe and Boiler Tubes.....	5.00	....
Cast Borings.....	3.00	....
Turnings.....	4.00	....
Horseshoes.....	8.00	....
Copper Bottoms.....	....	5 ¢
Copper Clips and Heavy.....	....	7 ¢
Heavy Brass.....	....	5⅛¢
Light Brass.....	....	3 ¢
Pipe Lead.....	....	2¼¢
Tea Lead...	....	2 ¢
Zinc.....	....	2 ¢
Rubber.....	....	3½¢

Anthracite.—Business is quiet. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill.....	$5.00	$5.25
Milwaukee, Wis.....	5.00	5.25
Kansas City, Mo.....	8.20	8.45
Council Bluffs, Iowa.....	8.20	8.45
Lincoln, Neb.....	8.35	8.60
Sioux City, Iowa.....	8.20	8.45
Aberdeen, S. Dak.....	8.25	8.50
Dubuque, Iowa.....	6.30	6.55
Madison, Wis.....	6.50	6.75
St. Paul, Minn.....	7.50	7.75
Burlington, Iowa.....	6.50	6 75
Des Moines, Iowa.....	7.95	8.20
Davenport, Iowa.....	6.30	6.55
St. Joseph, Mo.....	8.20	8.45
Leavenworth, Kan.....	8.20	8.45
Omaha, Neb.....	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver.....	$8.00
Pueblo.....	8.00
Colorado Springs.....	8.00
Leadville.....	8.00
Cheyenne, Wyo.....	10.00
All points between Denver and Missouri River.....	8.85

Trade Notes.

THE CLIMAX MFG. COMPANY, 415 Cuyahoga Building, Cleveland, Ohio, are directing attention to the Climax Flour Sifter of their manufacture. It is described as being operated with one hand, and various other advantages are alluded to.

THE TRADE will be interested in the announcement elsewhere of the Cortright Metal Roofing Company, Broad and Hamilton streets, Philadelphia, Pa., relating to galvanized steel shingles. The company inform us that heretofore they have made their goods only in tin plate and copper, but recognizing the fact that some people prefer galvanized goods, they have placed themselves in position to fill their wants.

CURTIS & CURTIS of Bridgeport, Conn., manufacturers of the Forbes Patent Die Stocks and all kinds of Pipe Working Tools and machinery, find that their labor saving machinery and tools are coming into such general use abroad that they have decided to send out one of their firm to consult with their agencies which are scattered throughout Europe and to look after their interests generally. Lewis B. Curtis expects to sail on May 16, and will be absent about three months. They inform us that they are running their works with a full force and are very busy with both foreign and domestic orders.

THE GEUDER & PAESCHKE MFG. COMPANY, Milwaukee, Wis., the well-known manufacturers of tin ware, make two very attractive articles in the line of Flue Stops—the Cream City, decorated and gold lacquered, and the G. & P., a handsomely lithographed design. Both styles are put up in paper boxes of one dozen each and in wooden boxes containing one gross.

THE RUE MFG. COMPANY, 116 North Ninth street, Philadelphia, Pa., publish their illustrated catalogue for 1894. The goods noted in the circular are the specialties of the manufacturers, which include the Little Giant, Fixed Nozzle and Unique Injectors; also Rue's Patent Boiler Washing and Testing Apparatus. The devices are illustrated and prices are given.

E. S. WHEELER & Co., New Haven, Conn., who have a large and particularly well equipped warehouse, announce that they are in specially good position to handle the business of close buyers of Tinners' and Plumbers' Supplies in any section of the country east of the Mississippi River, and to supply their distant trade from factory connections near to buyers. Their offering in our advertising columns this week is special figures in Cement Wash Trays.

AVERY STAMPING COMPANY, Cleveland, Ohio, advise us that Mervin S. Near of New York will represent their interests in the East, while A. E. Bronson of Cleveland will look after their welfare in the West.

CONDITION OF THE

Hardware Trade.

TRADE CONTINUES somewhat uneven in volume, there being complaint in regard to it in some sections, while from others reports indicate that business is on the whole improving, though not attaining to the volume of last year. The demand, however, is more uniform than it has been for some time, covering as it does a more general assortment and indicating a return of a healthful condition. There is still evidence of great caution on the part of merchants in purchasing, and it is apparent that business is still moving somewhat sluggishly. The cold, inclement weather which has prevailed in many parts of the country has had the effect of repressing business somewhat. We regret that we are not justified in referring to the state of the market in the matter of prices as showing signs of improvement. On the contrary, there has been a gradual settling in the prices of many goods for some time, manufacturers making all possible concessions with a view to inducing business. The fact that wages have been quite generally reduced and have still a downward tendency has its influence in the same direction, and the result has been that on many lines of staple and Shelf Hardware lower prices are now ruling than prevailed a few months ago. The large buyers for the most part get the benefit of these reduced quotations, but there is a disposition on the part of many manufacturers to sell retailers in fair lots at prices which approximate those at which they sell the jobbing trade. There is also among the jobbing houses a disposition to cut prices on many leading goods. As a consequence of these conditions the market as a whole is in an unsettled state with a downward tendency. This naturally induces especial care in buying goods, merchants with scarcely any exceptions limiting their purchases to their early requirements.

Advices from Chicago.—The first week in April has proved a disappointment to Shelf Hardware jobbers. The volume of business has fallen considerably below that of the corresponding period in March. It had been hoped that the spring demand would extend over the month of April, but the trade was evidently without sufficient strength to carry it much fnrther than the first. The falling off extends to all classes of goods and appears to be equally distributed throughout the city and country trade. The city trade is of course affected by the building troubles. The Heavy Hardware jobbers report about the same condition of affairs in their branch. March was an exceedingly good month, but with the recurrence of cold weather the demand for Heavy Hardware immediately declined. Business is now dragging.

Notes on Prices.

Wire Nails.—The demand continues good, manufacturers being in receipt of some relatively large orders from jobbing houses and a good many orders of moderate size from the smaller trade. The aggregate of business is fair, and the mills are generally well supplied with orders. They are, however, desirous of securing business to keep their mills in operation for the next month or two. Competition is thus active and prices relatively low. Ninety-five cents at mill for round lots probably represents the market, some manufacturers being unwilling to make this price, however, except on especially large and attractive lots. There is, however, little difficulty in obtaining this figure on carload lots. Small lots from store in New York are held at $1.20 to $1.25.

Advices from Chicago.—Jobbers appear to have control of the business now coming up. The quotations they make on carloads are as low as manufacturers' prices. This causes the Wire Nail market to appear weaker than the facts would justify, although some decline has taken place in manufacturers' prices. The competition is, perhaps, greater for business in this city than in outside territory. Carload lots are quoted at $1.05, Chicago, while small lots from stock sell at $1.15 to $1.20.

Cut Nails.—The condition of the Cut Nail market is substantially the same as last week, with some unevenness in quotations, especially as the Eastern manufacturers are feeling to some extent the effect of Western competition. The price of Nails in car lots, delivered in New York, is 95 cents to $1 base. Small lots from store in New York are held at $1.10 to $1.15, with concessions on larger lots.

Advices from Chicago.—Little is now heard of the attempt of the Ohio River manufacturers to sell in this market. Local manufacturers report a fair trade for the week, but the volume of business is somewhat below the average of the previous weeks. Prospects are good for a fair trade with the Dominion of Canada in consequence of the reductions in the tariff. Inquiries are being received from numerous Canadian points. Factory prices are unchanged at $1 on 55-cent average. Small lots are selling from stock at $1.15.

Barb Wire.—The demand for Barb Wire continues good, though not so heavy as a few weeks ago. There is also evidence of some irregularity in prices, and some of the manufacturers are making concessions on the regular quotations on Four Point Galvanized, delivered, which are as follows: Pittsburgh, $2.15; Cleveland, $2.20; Cincinnati or Allentown, $2.25 ; Chicago or New York, $2.35.

Advices from Chicago.—Business has fallen off considerably within the past week or ten days. Buyers generally appear to have covered their wants, and the trade will now experience a period of dullness until stocks pass into consumers' hands. Manufacturers are also again taking control of the trade with consumers. Inquiries for both Plain and Barb Wire are being received from Canadian points, and some sales have already been made. Prices on Galvanized Barb Wire are unchanged at $2.25 to $2.30 for carload lots, and $2 35 to $2.40 for small lots from stock.

New Brass List.—A new list was adopted by the Brass manufacturers on April 9. The list as thus revised corrects many inequalities in the old list, and with the new discount makes an advance in some goods, especially in Brass Tubing, the new prices of which are considerably higher than the old. The list prices of some of the goods have been revised simply with a view to making them, with the rest of the list, subject to a uniform discount of 40 per cent.

Bright Wire Goods.—The market for Bright Wire goods, which continues an open one, has recently been characterized by active competition between the different manufacturers, with the result of inducing considerably lower quotations than have heretofore prevailed. As a result a discount of 90 and 20 per cent. is obtainable. There is, however, some inequality in the prices quoted by the manufacturers, and some of them refuse to meet the extreme prices of their competitors.

Cordage.—The Cordage market is in no better condition than last week and prices are a shade lower. Manila is now more frequently sold at 6 cents base than it was a week ago, but some of the manufacturers are still holding it at 6¼ cents, these figures applying to large lots. Sisal is quotably lower, being now readily obtainable at 4 cents base. New Zealand is held at the same figure, but with a moderate demand. Notwithstanding the low prices which are ruling the volume of business is only fair, as current quotations seem to have little effect in inducing the trade to purchase beyond their present requirements.

Suction Faucet.—Suction Faucet No. 64, put on the market by the Enterprise Mfg. Company of Philadelphia. is sold to the trade at $5 each, subject to a discount of 25 and 10 per cent.

Aluminum Chafing Dish.—Wohler Aluminum Company, 55 Jackson street, Chicago, are putting this article on the market. The Chafing Dishes are listed at $12 to $14, the discount to the trade being 50 per cent.

Glass.—The improved condition of the Glass market referred to in our report of last week continues, and manifests itself by a tendency toward stiffer prices. Prices that have ruled for some time have been far from satisfactory, and with the prospective spring demand manufacturers are hoping for some concerted action among them-

selves toward securing better prices. This movement is more pronounced throughout the western natural gas belt, though it is reported that some Pittsburgh manufacturers have withdrawn their former quotations. The New York Glass market is represented by the following quotations: In small quantities, single strength, 85 and 5 per cent. discount; double strength, 85 and 10 per cent. discount. In 1000-box lots, single strength, 85 and 10 per cent., and double strength, 85 and 10 and 10 per cent. discount. Pittsburgh quotations are reported as being 85 and 10 per cent. discount for single, and 85 and 15 per cent. discount for double strength Glass at factory. The demand for Plate Glass, it is understood, is improving, though no change has taken place in prevailing quotations, and are reported from Pittsburgh as being 70 and 10 and 5 per cent. discount.

Old Metals.—Business is rather better in Old Metals, although prices show little or no improvement. Old Iron and Steel meet with comparatively fair sale, but the quantities involved are unusually small. Wrought Scrap particularly is in better demand in the New York market. The following quotations represent dealers' purchasing price, New York or Jersey City delivery:

Heavy Copper	℔ lb	7¢
Light and Tinned Copper	℔ lb	6¢
Heavy Brass	℔ lb	5¢
Light Brass	℔ lb	4¢
Lead	℔ lb	3¢
Tea Lead	℔ lb	2⅛¢
Zinc	℔ lb	2¼¢
No. 1 Pewter	℔ lb	15¢
No. 2 Pewter	℔ lb	6¢
Wrought Scrap Iron....℔ gross ton	$7.50 @	$8.50
Heavy Cast Scrap.....℔ gross ton	7.00 @	8.00
Stove Plate Scrap.....℔ gross ton	4.00 @	5.00
Burnt Iron, ℔ gross ton	3.50 @	4.00

Old Rags, Paper, &c.—The volume of business in these materials has been fairly large, although not up to the general average of last month. Prices are steady but continue low, the following quotations being about the rate offered in this market:

No. 1 White Rags	℔ lb	3¼ @ 3½¢
No. 2 White Rags	℔ lb	2 @ 2¼¢
Mixed Rags	℔ lb	¾¢
Blues and 3ds	℔ lb	1 @ 1¼¢
Hard Sized White Shavings	℔ lb	2¼ @ 2½¢
No.1 White Book Shavings	℔ lb	1¾ @ 2 ¢
No.2 White Book Shavings	℔ lb	1 @ 1⅛¢
Light Book Shavings	℔ lb	¾¢
No. 1 Mixed Shavings	℔ lb	¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb	½ @ ¾¢
No. 1 Printed Books	℔ lb	1 @ 1¼¢
Ordinary Mixed Books	℔ lb	½ @ ¾¢
Newspapers	℔ lb	2-5 @ ½¢
No. 1 Manila Paper	℔ lb	1 @ 1⅛¢
No. 2 Manila Paper	℔ lb	⅝ @ ¾¢
Bogus Paper	℔ lb	½¢
Common Paper	℔ lb	⅜¢
Straw Chips	℔ lb	½¢
Binders' Clippings	℔ lb	½ @ ⅝¢
Jute Butts	℔ lb	1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb	1 @ 1¼¢
Mixed Bagging	℔ lb	¾ @ 1 ¢
No. 2 Bagging	℔ lb	½ @ ¾¢
Hemp Twine	℔ lb	2 @ 2¼¢
Manila Rope	℔ lb	2¼ @ 2⅜¢
Jute Rope	℔ lb	1½ @ 1¾¢
Mixed Rope	℔ lb	¾ @ ⅞¢

Old Rubber.—The market for Old Rubber shows some improvement, but prices are somewhat irregular. The following quotations represent approximately those given by dealers in this city:

Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb..	@	.03½
Rubber shoes, less than carloads, ℔ lb	@	.03⅛
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

The Gilbert & Bennett Mfg. Company, 148 Lake street, Chicago, are now manufacturing Poultry Netting at their Chicago factory. It is made of wire galvanized before weaving. The company state that while they do not regard it equal in durability and strength to standard "G. & B." Netting galvanized after weaving, it is made of as good material, as perfectly woven and rolled up in the same manner as all other Netting of the same kind. The company are therefore prepared to furnish the trade with either kind of Netting, galvanized before weaving or galvanized after.

E. T. Barnum, Detroit, Mich., issues a very extensive illustrated catalogue of his wire and iron goods. The pamphlet, which contains 120 pages, is profusely illustrated and shows a varied line of art and iron work. Settees, chairs and benches are followed by gates, netting, guards, &c. Later on attention is given to stable fittings, then come railings, fire escapes, stairways, grills, crestings, finials, weather vanes, &c.

The All Right Lamp Stove.

The Coldwater Oil Stove Company of Coldwater, Mich., are manufacturing a lamp stove of their own design, which is herewith illustrated. The cut shows the No. 10 stove, with the top thrown back in position for lighting or trimming the wick. This stove stands 14 inches high, the top is 8 inches square, the lamp is a central draft lamp of high power, and the oil tank is made entirely of drawn brass. The base and frame are of cast iron, fully nickeled. The No. 15 stove has a longer base, holding two lamps, and thus making it double the capacity of the No. 10. An oven is made by the company of suitable size for this stove which is capable of doing a considerable range of work. They have their own foundry and nickeling plant and make all parts of these stoves.



The All Right Lamp Stove.

Burt Cole has moved his tin shop to the store formerly used by J. B. Kessler as a storeroom, at Adrian, Mich.

A. La Rock is to continue the tin and plumbing business at Franklin, Vt., at the old stand of W. H. Lautman & Son, who have moved to East Highgate.

Canonsburg Iron & Steel Company of Pittsburgh, Pa., with works at Canonsburg, Pa., started up their new tinning pots on March 22 for the manufacture of tin and terne plate. The plant has a capacity of 80 boxes per day.

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Metal and Miscellaneous Prices.

CHICAGO, APRIL 12, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Oalland and MelynGrade	IC, 10 x 14.....@	$6.75
	IC, 12 x 12.....@	6.75
	IC, 14 x 20.....@	6.75
	IC, 20 x 28.....@	13.50
	IX, 10 x 14.....@	8.75
	IX, 12 x 12.....@	8.75
	IX, 14 x 20.....@	8.75
	IX, 20 x 28.....@	17.50
	DC, 12½ x 17..... @	6.50
	DX, 12½ x 17.....@	8.50
Allaway Grade,	IC, 10 x 14.....@	6.35
	IC, 12 x 12.....@	6.35
	IC, 14 x 20.....@	6.35
	IC, 20 x 28.....@	12.70
	IX, 14 x 20.....@	7.85
	IX, 20 x 28.....@	15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔..... @	5.25
IC, 14x20, 100℔..5.50 @	5.65
10 x 20..... @	8.50
20 x 28...11.30 @	11.50
IX, 10x14, 14 x 20 .....@	7.25
B.V. Grade. IC,10x14. 14x20.5.75@	5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—
IC. 14 x 20 ...@ $5.62½
20 x 28.....@ 11.25
IX. 20 x 28.....@ 14.25

Worcester Brand and equal.—
IC, 14 x 20.. 6.12½@ .....
IC, 20 x 28..12.25 @ .....
IX, 14 x 20.. 7.62½@ .....
20 x 28..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28.....	$13.00	$13.00
XX, 14 x 28.....	14.50	14.50
X, 14 x 31.....	14.50	15.80
XX, 14 x 31.....	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56... ...	29.50	16.50
XX, 14 x 56.....	32.50	18.20
X, 14 x 60.....	31.50	17.65
XX, 14 x 60.....	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal extra. IC, 14 x 20.... ..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20.....$6.00
" IC, 20 x 28.....12.50

Roofing Plates.

Arch, IC, 20 x 28.....@$11.25
Crescent, IC, 20 x 28.....@ 11.75
Crescent, IX, 20 x 28.....@ 14.75
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18.00
Merchant's Roofing (extra coated), IC, 20 x 28.....@$17.75
Merchant's Roofing (extra coated), IX, 20 x 28.....@$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28..... .@$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28.....$23.60
Westmoreland:
IC, 14 x 20..... $5.87½
IC, 20 x 28..... 11.75
Elwood:
IC, 20 x 28..... $11 75
Juno:
IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50
Illinois, Old Method:
IC, 20 x 28.....$17.00
E. L.:
IC, 20 x 28.....$12.50
Jessie:
IC, 20 x 28.....$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20.....$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$0.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared).....19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)..... 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50
Columbia, IC, 14 x 20 (Stamped).... 7.25
" IC, 20 x 28 (Stamped)....14.50
Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....13.50
Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00
Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50
Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28 ..... 12.00
" IX, 20 x 28 ..... 15.00
" (Redipped), IC, 20 x 28 .....17.00
Old Process:
IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50
H. B. L., Old Style:
IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16.....℔	2 4-10¢	3 ¢
17 to 20.....℔	2 5-10¢	3 1-10¢
21 to 24.....℔	2 6-10¢	3 2-10¢
25 and 26.....℔	2 7-10¢	3 3-10¢
27.....℔	2 8-10¢	3 4-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75%

Copper—

Ingot.

Lake.....11¢ @ 11½¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing.
(To No. 20 inclusive.)

Add freight from New York to Chicago to these prices, or 50¢ ℔ 100 ℔.

Above 5-16 inch to 3 inch inclu...35¢
Plain, above 3 inch.....45¢
Plain, 5-16 inch.....45¢
Plain, ¼ inch.....60¢
Plain, 3-16 inch.....$1.00
Plain, ⅛ inch.....$1.50
Fancy Tubing, Brass, to No. 20 incl.....43¢ ℔
Bronze Tubing, 3¢ ℔ ℔ more than Brass.....
(40 @ 45%)

Roll and Sheet Brass.

Discount, 35 @ 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets.....5½¢

Lead—

Soft Pig Lead.....3¾¢
Bar.....4¼¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....12½¢@12¾¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12¢@12½¢
Hallett's.....11½¢@11¾¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain.....60&10%
1¼ and under, Galv.....52½&10%
1½ and over, Plain.....70&10%
1½ and over, Galv.....60&10%
Boiler Tubes, list Oct. 24, 1892....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.... 55¢
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7½@8 ¢
Iron Paint, Bright Red.....℔, 2 ¢
" " Brown.....℔, 1½¢
" " Purple.....℔, 2½¢
" Ground in oil, B. Red ℔, 6½¢
" Ground in oil, Red..℔, 6½¢
" Ground in oil, Brown ℔, 5¾¢
" Ground in oil, Purple ℔, 6 ¢
Linseed Oil, Boiled, in bbls.....54¢
Linseed Oil, Raw, in bbls.....51¢
Mineral Paints.....2@4¢
Orange Mineral.....9½¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls, ℔ gal..... ..34¢
Spirits Turpentine, in bbls., ℔ gal...35½¢
Asphaltum, Trinidad Refined, ℔ ton..$45
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, APRIL 13, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure, in rolling ingots:
Small lots.....℔, 75¢
100-℔ lots.....℔, 73¢
Ton lots.....℔, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots.....℔, 70¢
100-℔ lots.....℔, 65¢
Ton lots.....℔, 60¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots.....℔, 65¢
100-℔ lots.....℔, 60¢
Ton lots.....℔, 55¢

Antimony—

Cookson.....℔, 10¾¢
Hallett's.....℔, 10 ¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894

Plain Round Tube.	Per ℔.
¾ in. up to 2 in., to No. 19, inc.,	$ 1.35
⅝ in. up to ¾ in., to No. 19, inc.,	.36
½ in. up to ⅝ in., to No. 19, inc.,	.38
⅜ in. up to ½ in., to No. 19, inc.,	.41
5 16-in. up to ⅜ in., to No. 19, inc.,	.18
¼ in. up to 5-16 in., to No. 19, inc.,	.55
3-16 in. up to ¼ in., to No. 19, inc.,	1.00
⅛ in. up to 3-16 in., to No. 19, inc.,	1.50
Smaller than ⅛ in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 15, inclusive,	.38

(45 @ 30%)

Copper and Bronze Tubing—
8¢ ℔ ℔ more than brass.

Bronze, Tobin—

Cookson Rods for Bolts, Forgings, &c
Over ¼ to 8½ inches inclusive....17¢ ℔ ℔
Over 3½ to 5 inches inclusive ....18 ℔ ℔

Cookson Rods, Finished True, Smooth and Straight.

Over ¼ to 8½ inches inclusive....18¢ ℔ ℔
Over 3½ to 5 inches inclusive.....19¢ ℔ ℔

Clips—

Buffalo Damper: Nos. 1, $1,25; 2, 2.50 per doz.....40&10%

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—
Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Mitres; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*12¢ ℔ ℔, net
Ingot.
Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9¼¢
Planished......net
Sheet and Bolt......15¢ ℔ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Coppers, Soldering—

See *Irons, Soldering*, in Current Hardware Prices.

Damper Clips Buffalo—

See Clips, Buffalo Damper.

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint, Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—
Tin.....70%
Galvanized.....70%

Crimped Tubing—
Re-Tinned or Galvanized.....35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.
Tin.....35%
Galvanized.....35%

Corrugated.
Flat Crimp.
Galvanized.....60%

Round or Square.
Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16....℔	2.50.....	2.80¢
Nos. 17 to 21 ℔	2.60.....	2.90¢
Nos. 22 to 24....℔	2.70.....	3.00¢
Nos. 25 and 26..℔	2.80.....	3.10¢
No. 27..... ....℔	2.90.....	3.20¢
No. 28.....℔	2.95.....	3.30¢
American B. B.....℔		4¢@4½¢

Russia, Planished, &c.
Genuine Russia, according to assortment.....℔, 11¾¢@12½¢
Patent Planished....℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ 3¾¢

Galvanized.

	B. B.
Nos. 10 to 16.....	70&10@75%
Nos. 17 to 21.....	
Nos. 22 to 24.....	
Nos. 25 to 26.....	
No. 27.....	
No. 28.....	
No. 29	
No. 30	

Filter Joints—

Lee's.....83⅓%

Lead—

American Pig.....3¾¢@4¢
Bar.....4½¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil..... 6¾ @ 7¾
Lead, Red, bbls. and ½ bbls... 6½ @ 7
Lead, Red, kegs..... 6¾ @ 7
Ocher, American..... 1 @ 1½
Red Venetian, American..... 1½ @ 2½

Linseed Oil:
Raw, ₩ gal..... @ .40
Boiled..... @ .48

Spirits Turpentine:
In bbls..... @ .32

utty:
In barrels and ½ bbls..... .01⅝ @ .01¾
In tubs..... .01⅝ @ .01¾
In tin cans..... .01¾ @ .02¼
In bladders..... .01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton.....$30.00@$35.00
Asphaltum, Rock, ₩ ton.....$14.00
Coal Tar Felt, 1 Ply, ₩ ℔.....2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl.....$2.25

Pipe, Drain.....50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 Inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₩ bbl. $1.19@$1.20
Rosin, E. & F..... ₩ bbl. $1.30@$1.45
Rosin, G. & H. .....₩ bbl. $1.65@$1.90
Rosin, I. & K.....₩ bbl. $2.25@$2.60
Rosin, M. & N.....₩ bbl $2.90@$3.00

Seamless Brass Tubes..ne

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.50@ 4.25
Peach Bottom, ₩ sqr.....5.00@ 6.25
No. 1 Chapman, ₩ sqr.....4.00@ 4.65
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.70@ 3.20
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½ & ½..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢
5% dis.

Yager's Soldering Salts.
½-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... ....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—See *Elbows, Stove Pipe.*

Stove Polish—See *Polish, Stove.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized..... 60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....21¾¢
Straits, pigs, ₩ ℔..... 21¢ @ 21¼¢
Straits in bars, ₩ ℔.....22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20 .. $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20 ..... 5.75
Bonus, Extra Coated, IC, 14 x 20 .. 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28 ..... 11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20 ..... 5.50
Columbia, IC, 14 x 20..... 7.00
Crescent, IC, 14 x 20..... 6.00
Dane, IC, 14 x 20 ..... 5.50
DeMitt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28 .... 12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20 ....6.12½
Extra Central, IC, 14 x 20.... .....5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28..... .....11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20... 6.25
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Old Method (Resquared), IC, 14 x 20 ..... 9.50
Mercbant's Roofing (Resquared), IC, 14 x 20..... 8.50
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28. ..... 15.00
Newcastle Real Old Method, IC, 14x20.9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20 .... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20 ..... 5.25
Palaclo, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... .....10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongabela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20 ....5.37½
Vigilant, IC, 14 x 20 ....5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20.. ..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20..... .....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20 ..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merlon, IC, 14x20.. ..... 6.75
Mint, IC, 14x20 ..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. .. 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20. .... 7 25
Versailles, IC, 14 x 20 ....5.75
Youghiogheny, IC, 14 x 20.. .....6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$7 50
20 x 28..... 15.00
IX, 14 x 20..... .... 8.75
20 x 28... .....17 50
Pontymister Grade, IC, 14 x 20..... 6 50
20 x 28.....13.00
IX, 14 x 20.... 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28..... 11.50
IX, 14 x 20..... 6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20... ..... $5.37½
20 x 28.....10.70
IX, 14 x 20..... 6.40
20 x 28..... .....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10.50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
" "	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20..... 8.12½
20x28.....11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper..... ....net

Tubing—

Tin..... ....55%
Galvanized..... ..55%

Brass and Copper.—

Standard List..... 25@30%

Troughs, Eave—See *Eave Trough*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Zinc—

600 ℔ casks..... ₩ ℔ 4½¢
Per ℔..... .....5¢@ 5¼¢

It Is Reported—

Alabama.

That the Hardware firm of Luttrell & Fuller, BREWTON, has been succeeded by Luttrell, Fuller & Co. The only change made in the business was the admission to partnership of R. E. Mallett, who has for several years past been in the employ of J. Randolph Brown of Troy, and who is referred to as a Hardwareman of considerable ability and experience.

California.

That Z. C. Mathes has opened a new Hardware store in the Snyder Block, SAN DIEGO.

Florida.

That W. H. Parkin, formerly of Cleveland, Ohio, will soon open a new Hardware store at PALM BEACH, DADE COUNTY. Palm Beach is the terminus of the new Jacksonville, St. Augustine & Indian River Railroad. Mr. Parkin's store will be the only exclusive Hardware store at Palm Beach, which has grown largely during the last six months. He expects to conduct both a wholesale and retail business.

Illinois.

That Hopkins Bros., CENTRAL PARK, have purchased the Hardware and Tinware stock of H. E. Rebmann. Mr. Rebmann contemplates taking a trip to California.

That the Hardware stock of Wadsworth & Matheson, JACKSONVILLE, was completely destroyed by fire on the 26th ult. The loss is estimated at $30,000.

That S. F. Yeager & Son of PEARL CITY have disposed of their Hardware stock to John Klapp and A. M. Schotz.

That S. O. Stillman, GALENA, has been succeeded in the Hardware business by Stillman & Stahl.

Indiana.

That J. W. Miller has purchased an interest in the Hardware store of F. V. B. Minnich, GOSHEN. The style of the firm will hereafter be the Minnich Hardware & Furniture Company.

Iowa.

That W. H. Sedam is a new Hardwareman at STANWOOD.

That Kunz & Fay's Hardware store, BELLEVUE, was burglarized on the 26th ult. Thirty dollars' worth of goods were taken by the thieves.

That Liebig & Sons, KALONA, have sold their Hardware store to Lucas, Rust & Smith of KINROSS.

Kansas.

That the Woodbine Hardware Company's store, at WOODBINE, was destroyed by fire on the 29th ult.

Maine.

That F. T. Dana, WISCASSET, dealer in Hardware and Cutlery, has removed to a new location in that place.

Massachusetts.

That the Stove stock of Folger & Reagan, GLOUCESTER, was damaged by fire on the 5th inst.

That Thurston, Hale & Co. have recently entered the Hardware business at ROCKPORT.

Michigan.

That the dynamite storehouse of the Ferguson Hardware Company, SAULT STE. MARIE, blew up on the 31st ult. It contained 5000 pounds of the explosive. The explosion shook the entire town and broke many windows.

That D. Leach, MINDEN CITY, is now conducting the Hardware business formerly carried on by Geo. W. Thayer & Co.

That J. C. Cozad has succeeded A. B. Kleaber in the Hardware business at WAYNE.

That L. S. Dickinson's Hardware store at FENNVILLE was recently entered by thieves, who took away about $60 worth of Knives, Razors and Revolvers.

Minnesota.

That H. A. Boyer of FOUNTAIN has purchased the Hardware and lumber business of John Johnson, and will take possession of it on May 1.

Missouri.

That the Hardware stock of H. A. Walcott, CARTHAGE, was damaged by fire to the extent of several thousand dollars on the 30th ult.

New York.

That John Lilley's Hardware store at BAINBRIDGE was burned out on the 2d inst. The loss was fully covered by insurance.

That Murphy & McEligott's Hardware store at CLYDE was slightly damaged by fire on the 3d inst.

That Leonard Jones of Remsen has entered the Hardware and Tin business at HINCKLEY.

That Frank Hall, Hardware merchant of PRATTSBURGH, has sold out to Flynn & Walker.

That Peter J. Kimmel has bought a half interest in the Hardware business of M. Kimmel & Son of COHOCTON.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

STOVE SALESMAN in Massachusetts, Rhode Island, Connecticut, New York and Pennsylvania can make good side commission by addressing O. G. & D. H. Donaldson, Buffalo, N. Y. Apr. 14

A young man that understands tin and sheet iron business; one that can read and write a good hand and is capable of taking charge of store; please state wages wanted. "Capable," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

An A 1 STOVE SALESMAN for New York City trade; state age, experience and salary wanted. "J. B," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

SALESMAN for a first-class line of stoves for Ohio, Illinois, Minnesota and Wisconsin. "N. H.," No. 414, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

A first-class TINSMITH at once to work on milk coolers; one preferred with small capital. H. W. Gazley, Cortland, N. Y. Apr. 14

A RETINNER, with experience in retinning tinware, and capable of taking charge of a retinnery; steady job to capable man. Standard Stamping Company, Second and Chambers streets, St. Louis, Mo. Apr. 14

A competent PLUMBER; one used to country work preferred; to a man that is not afraid of doing a good day's work steady work and fair wages will be paid; state experience and wages expected. Burbank, Studd & Metze, Berlin, N. H. Apr. 14

TRAVELING SALESMEN, visiting the retail hardware trade, to handle our goods as a side line; no samples to carry; sales made from catalogue and small nickel model weighing 2 pounds or less; full information and catalogue sent on application. Lock Box 34, Pike, N. Y. Apr. 14

PLUMBER and TINNER for country shop; must understand his business; one with some knowledge of the hardware business preferred; steady job to the right man; immediately; state age, wages and experience; married or single. O. H. Tebay, Leechburg, Pa. Apr. 14

SALESMEN calling upon the gasoline stove, hardware or grocery trades, to handle our complete line of oil cans, tanks, &c., on commission; easy sellers. right prices and liberal commission. "Oil Cans," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

A good boy between 16 and 18 years of age to learn the tinning and plumbing trades; one who will serve for three years; $30 a year, board and washing; good home for a good boy. A. M. Kreider, Lititz, Pa. Apr. 7

A good all round TINSMITH, with some knowledge of plumbing; temperate and industrious; to the right party a steady position is open; state wages expected. 545 Main street, Niagara Falls, N. Y. Apr. 7

By a tin plate and metal house, a first-class SALESMAN who thoroughly understands tin plates, sheet iron, brass and copper goods, to travel in the West. Address, with references, P. O. Box 1530, Philadelphia, Pa. Apr. 7

SITUATIONS WANTED.

By a good TIN, SHEET IRON and FURNACE WORKER; understands steam and hot water fitting and the combination steam and hot air work. Chas F. Snyder, 73 East Louisa street, West St. Paul, Minn. Apr. 14

By a young man 20 years of age, with three years' experience at plumbing and gas fitting; can wipe a good joint; some knowledge of tin, sheet iron and range work; city or country. F. V. Martin, Box 153, New Milford, Conn. Apr. 14

By a TIN and SHEET IRON WORKER, who is also a gas and hot water fitter; 15 years' experience at general jobbing; reference. J. Walden, New Rockford, N. D. Apr. 14

By a perfect TIN, SHEET IRON WORKER and ROOFER; steady position in or out of town. T. Greenberg, 64-66 Canal street, New York City. Apr. 14

By a practical TIN and SHEET IRON WORKER; some knowledge of furnace, range, heater work, roofing and general jobbing. "Tinsmith," 242 North Second street, Williamsburg, Brooklyn, N. Y. Apr. 14

By a PLUMBER; learnt trade in Philadelphia; plumbing, gas, jobbing or steam work, sanitary drainage, and house wiring on Edison system; age 23; honest, sober and willing to work; can furnish reference. Henry M. Wendel, 32 S. Wyoming street, Hazleton, Pa. Apr. 14

By a TINNER; four and a half years' experience; can do roofing, spouting, stove, pump and shop work; strictly temperate; best of references. A. F. Segerstrom, Forest City, Iowa. Apr. 14

By a first-class PLUMBER; city or country; 15 years' experience as an all around worker. J. M. Harrington, 140 Degraw street, Brooklyn, N. Y. Apr. 14

By a CORNICE and SKYLIGHT MAKER, as FOREMAN of a small shop or assistant cutter in a large shop; nine years' experience; 27 years of age; understands English and German. L. D. Retman, 111 Delancey street, New York City. Apr. 14

By a good TINSMITH, for in and outside work, used to country work, also general jobbing; willing to work in city or country. Address J. Cohen, 148 Delancey street, New York City. Apr. 14

By a practical MECHANIC and INVENTOR on tin and iron work, spinning and drawing press iron. E. Plancom, 863 Park avenue, Brooklyn, N. Y. Apr. 14

By a TINNER; can do roofing, bench and furnace work; 14 years' experience at trade; strictly temperate and reliable and not afraid of work; would like position where I could learn pipe fitting. "G. A. B.," 147 Cabot street, Lowell, Mass. Apr. 14

By a first-class PLUMBER; not particular as to locality. J. Reilly, 504 West Twenty-eighth street, New York City. Apr. 14

By a good TINNER; eight years' experience at inside and outside work, general jobbing and furnace work; some knowledge of clerking; can make up tinware; sober and reliable; good references. Wm. F. Gritzmacher, Faribault, Minn. Apr. 14

A married man desires a steady situation at moderate wages with a good firm as SLATE and TILE ROOFER; understands his trade thoroughly and is capable to do tin and iron roofing and all kinds of jobbing; good workman with best of references; reason for desiring a position—former employer retired from business. "Slate and Tile Roofer," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

As BRASS MOLDER; well experienced on any class of work; location no object; an engineers' jobbing shop preferred. "W. B.," 36 Sampson street, Allegheny, Pa. Apr. 14

By a steady, sober and reliable TINNER; 15 years' experience on general work; reference furnished if required. "Tinner," 249 West Eleventh street, Anderson, Ind. Apr. 14

By a practical TINSMITH, ROOFER and GENERAL JOBBER; thoroughly experienced; city or country. Jacob Goodman, 99 Forsyth street, New York City. Apr. 14

In Wisconsin, Illinois or Iowa, by a good TINNER; 14 years' experience at all kinds of work; can speak English and German and clerk in store; married; strictly temperate; first-class references; two and one-half years with last employer. H. G. Hahedank, Albany, Wis. Apr. 14

By a first-class high and low pressure STEAM and HOT WATER FITTER; can make working plans and solicit work; expert at hot water; lots of experience; no objection to traveling; best of references. "Success," No. 414, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

FOREMANSHIP, by practical tin and sheet iron worker; can handle any number of men judiciously; best of references; sheet metal specialties preferred. C. Harvey, 251 Fourteenth street, Buffalo, N. Y. Apr. 14

As MANAGER or FOREMAN of stove works; 24 years' experience; understands the business in detail; thoroughly practical in mounting, polishing, plating and pattern fitting; has always handled men to the best advantage. "A. W. C.," care of Fred. W. Donnelly, 912 Carroll avenue, Chicago. Apr. 14

By a young man, 28 years of age, with five years' experience in the retail hardware and farm implement business; has natural talent for machinery; is sober and industrious; best of references. P. O. Box 65, Cordova, Md Apr. 14

By a first-class SKYLIGHT and CORNICE MAKER and CUTTER; can work from plans; willing to work at the bench or to take charge of shop; best of references; can speak English and German; willing to go on trial for a month; strictly sober and reliable. M. Grossman, 193 River street, Paterson, N. J. Apr. 14

As FOREMAN of stove mounting shop by a practical man; can handle any number of men; best of references. Geo. Balles, 163 Mackinaw street, Buffalo, N. Y. Apr. 14

A boy, 17 years old, with some knowledge of the plumbing trade, would like to learn it thoroughly. I. H. Singer, 222 Second street, New York City. Apr. 14

By a young man as TINSMITH; experienced in city and country work; position desired near New York City. Fred Waxman, 1208 First avenue, New York City. Apr. 14

A young man with two years' experience in the roofing, range and furnace trade would like to get a position as apprentice; good reference; will work anywhere in the United States. M. J. Walsh, 324 East Fortieth street, New York City. Apr. 14

A steady position by a competent STEAM FITTER and GENERAL JOBBER; one that has a good knowledge of plumbing and fully up in pump work; eight years' experience; not afraid to do a day's work; now employed in Boston, but wants a change. T. Frank Clark, 2 Trenton street, Charlestown, Mass. Apr. 14

By a first-class PLUMBER, city or country. C. J Smallen, 305 West Thirteenth street, New York City. Apr. 14

By a graduate of the plumbing department of the New York Trade School where he could be under instructions by May 1; no objections to a distant locality; best of references. "W. H. V.," Box 35, East Hamptou, L. I., N. Y. Apr. 14

By a TINSMITH of 20 years' experience at inside and outside work; general jobbing, furnace, steam, hot water and plumbing; references; steady job by the year. "T.," Box 414, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

By a first-class TINSMITH, on or about April 15; 22 years' experience; both inside and outside workman; understands furnace and range work in all its branches; can do iron pipe work and pump work. "Tiuner," Long Branch City, N. J. Apr. 14

By a TIN and SHEET IRON WORKER; 12 years' experience; uuderstands all outside work, gutters, roofing, furnace, stove, range and fireplace heator work and general jobbing; city or country. L. Saltman, 137 New street, Philadelphia, Pa. Apr. 14

Steady work, by a young man used to all kinds of tin, sheet iron and furnace work; some knowledge of lead and iron pipe work; sober and good workman. T. H. Atkinson, Virginia P. O., Ontario, Canada. Apr. 14

By a young man, 24 years of age, with seven years' experience at PLUMBING and GAS FITTING; country preferred. Henry N. Will, 18 Dodworth street, Brooklyn, N. Y. Apr. 14

By a first-class PLUMBER; city or country. Joseph Smollen, 533 West Thirty-ninth street, New York City. Apr. 14

By a PLUMBER and GAS FITTER; strictly sober; wages moderate. Henry W. Bauer, Paris, Ky. Apr. 14

By a first-class CORNICE MAKER; ten years' experience; understands all kinds of work; city or country. R. Schatz, 603 Poplar street, Philadelphia, Pa. Apr. 14

By a TINSMITH, inside and outside worker; understands furnace, range and heater work, also roofing and plumbing; married man; 25 years' experience; good references. Lock Box 102, Sterling, Kan. Apr. 14

By a practical TINSMITH, German, steady, for all kinds of jobbing, roofing, furnace, range and heater work; understands also plumbing and gas fitting. Printing Office, 521 Sixth street, New York City. Apr. 14

By an ELECTRO PLATER of long experience in silver, nickel and brass; best of references; wages moderate. H. M. Ostrander, Albany, N. Y. Apr. 14

With good firm doing hot air heating; have had several years' experience; am capable of estimating work from plans and handling men; would prefer job with firm doing both hot air and hot water work; will not go East; would accept position with firm as traveling salesman for good hot air furnace. "N. H. L.," Station A, Pittsburgh, Pa. Apr. 14

By a PUMP MAKER on first-class work only; best of references. Fred. Kennebecker, Middletown, Conn. Apr. 14

By a thoroughly experienced MANAGER with loog foundry experience; successful in establishing and running foundry agencies, wholesale and jobbing houses; bookkeeper and salesman. "Successful," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 7

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PLUMBERS, TINNERS' SUPPLIES.
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The manufacture of mica plates is described as follows by *La Lumière Electrique:* Small pieces of mica, the largest of which might be about 40 square centimetres, are made to fall through a long tube into a small tank mounted on wheels; into this tank is pumped a cement consisting of gum lac dissolved in alcohol. After having mixed up a sufficient quantity of the mica and cement to make the necessary thickness of plate, a piece of sheet iron is placed on the surface; this operation is repeated until the tank is full of layers of cemented mica separated by sheet iron plates. The whole is then subjected to gentle heat and compressed, excess of cement being allowed to flow away. The mica plates, when finished, can be lifted away from the tank. By the above method mica plates can be manufactured which are easy to work and of sufficient strength for ordinary purposes.

— He Humps Himself.—"They say that only lazy men ride bicycles. That's not so. I tell you, a man must be pretty active who rides a bicycle."

"I agree with you. The man who rides a bicycle humps himself."—*The Press.*

— "That young Noodles had a chance of making the best bargain of his life last night, yet he missed it."

"I'm not surprised. What was it?"

"Why, Miss Sharp offered him a penny for his thoughts."—*Exchange.*

— May Suffer for Exercise.—If this constant improvement in agricultural machinery goes on, by which the farmer now rides his plow, rake, harrow, seeder, mower, binder, &c., farming will soon be classed among the sedentary occupations.

— Mrs. Youngluv (at the grocer's for the first time): "I want some egg plant."

Grocer: "Yes, ma'am."

Mrs. Youngluv (severely): "And I want some that is fresh laid, too."

— "I am a colonel now," said young Mr. Gore of Louisville to Miss Bowling Green.

"How did you attain the rank?" asked she.

"I came of age yesterday."—*Harlem Life.*

— Haley (the landlord): "So you've bought this store of Goldstein's. Well, I predict that you'll fail here in less than six months."

Mr. Klinpstein: "Ach! You fladder me, Misder Haley."—*Puck.*

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This TEA KETTLE is made of "PURE METAL," all in one piece. No SPOUT to melt off. No SEAMS to open. No chance for LEAKAGE. Will not RUST or CORRODE. No plating to wear off. STIFF, FIRM and INDESTRUCTIBLE. Altogether the NEATEST, PRETTIEST, BEST, LIGHTEST one piece and most durable TEA KETTLE ever offered.

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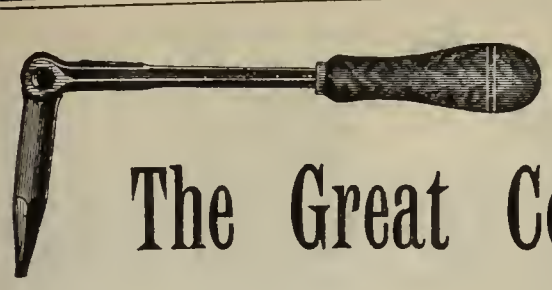
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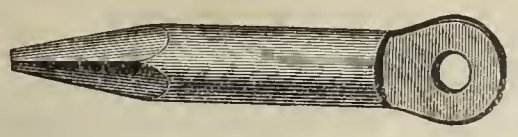
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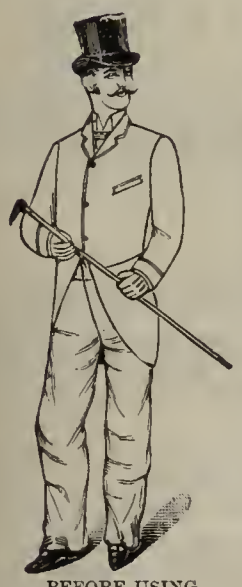
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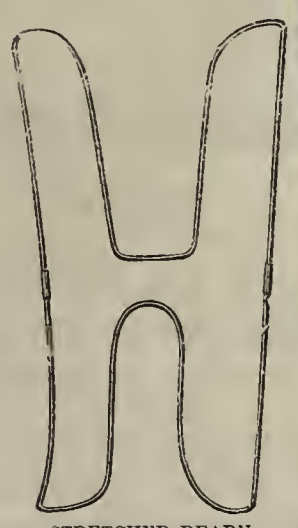
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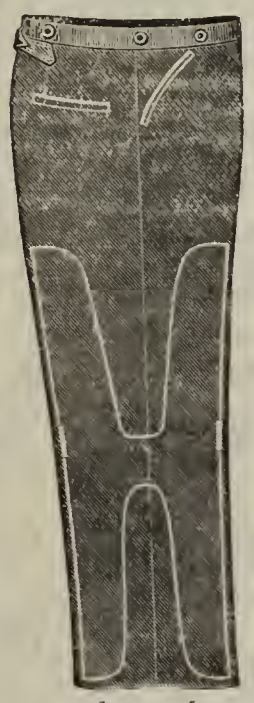
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He was a small boy, relates the New York *Herald*, and he was very much interested in the telephone. The pretty telephone girl at the Fifth Avenue Hotel put him up on a tall chair, and calling up a chum on the long distance wire, placed the receiver to his ear. He was so delighted that the first thing he told his mamma was that he had talked with a lady in Boston.

"And what did you tell her, dear?"

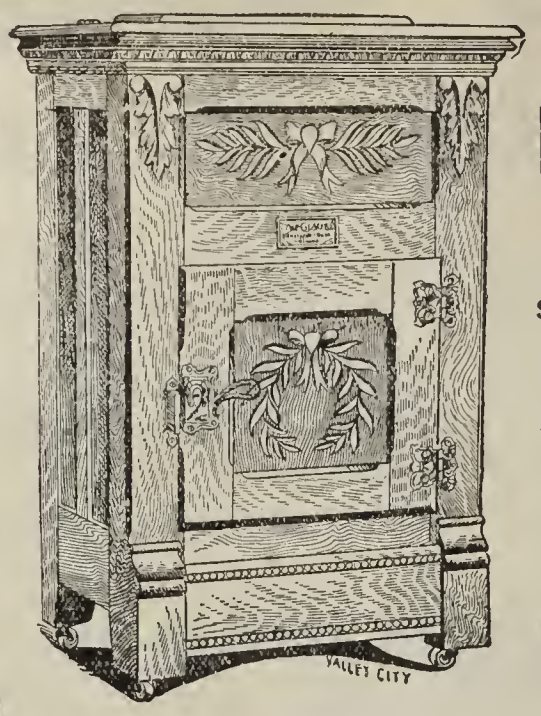
"I told her 'hello,' and then I told her my name."

"What did she say?"

"She said 'sput, sput, sput, sput!'"

In Germany, according to the *Maschinen-Constructeur*, india rubber is beginning to be used instead of carpets or wood flooring in apartments; or, rather, many experiments are being made in that direction. The rubber is employed in the form of sheets, 1 m. square and 5 cm. thick, which are placed side by side, after the floor has received a coating of beton. These floors are easily washed, and on this account and also because kegs can be easily rolled on them, they will be used in breweries and other places where heavy objects have to be moved.

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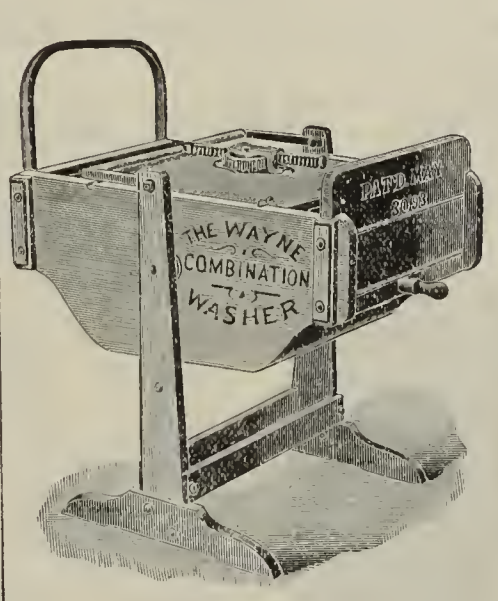


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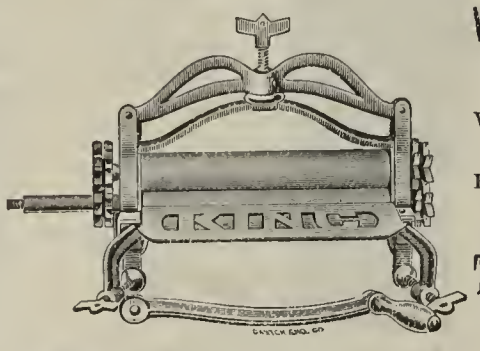


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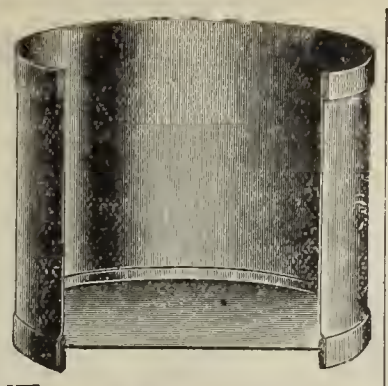
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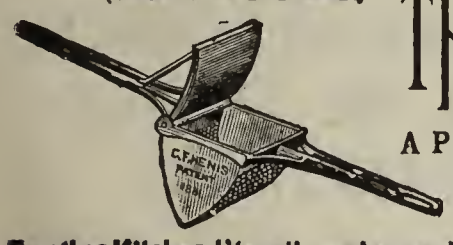
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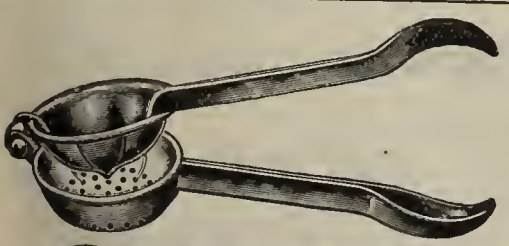
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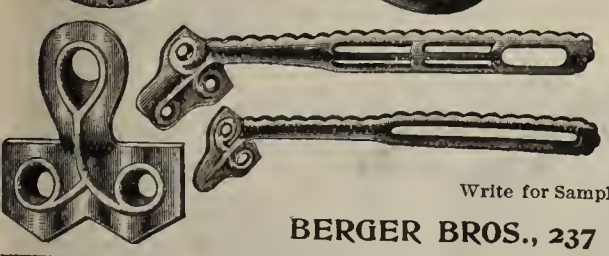


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Engineer Nelson's Description of a Piano Recital.

"I was loitering around the streets last night," said Jim Nelson, one of the old locomotive engineers running into New Orleans. "As I had nothing to do I dropped into a concert and heard a sleek Frenchman play a piano in a way that made me feel all over in spots. As soon as he sat down on the stool I knew by the way that he handled himself that he understood the machine he was running.

"He tapped the keys way up one end just as if they were gauges and he wanted to see if he had water enough. Then he looked up, as if he wanted to know how much steam he was carrying, and the next moment he pulled open the throttle and sailed onto the main line as if he was half an hour late.

"You could hear her thunder over culverts and bridges and getting faster and faster, until the fellow rocked about in his seat like a cradle. Somehow I thought it was old 'Thirty-six' pulling a passenger train and getting out of the way of a 'special.' The fellow worked the keys on the middle division like lightning, and then he flew across the north end of the line until the drivers went around like a buzz saw, and I got excited.

"About the time I was fixing to tell him to cut her off a little he kicked the dampers under the machine wide open, pulled the throttle 'way back in the tender, and how he did run! I couldn't stand it any longer, and yelled to him that he was pounding on the left side, and if he wasn't careful he'd drop his ashpan.

"But he didn't hear. No one heard me. Everything was flying and whizzing. Telegraph poles on the side of the track looked like a row of cornstalks, the trees appeared to be a mud bank, and all the time the exhaust of the old machine sounded like the hum of a bumblebee. I tried to yell out, but my tongue wouldn't move.

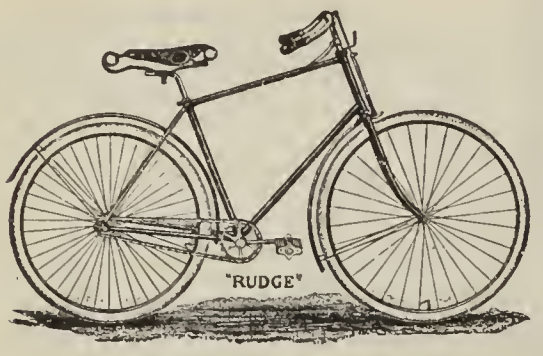
"He went around curves like a bullet, slipped an eccentric, blew out his soft plug, went down grades 50 feet to the mile, and not a controlling brake set. She went by the meeting point at a mile and a half a minute, and calling for more steam. My hair stood up straight, because I knew the game was up.

"Sure enough, dead ahead of us was the headlight of a 'special.' In a daze I heard the crash as they struck, and I saw cars shivered into atoms, people smashed and mangled and bleeding, and gasping for water. I heard another crash as the French professor struck the deep keys away down on the lower end of the Southern division, and then I came to my senses.

"There he was at a dead standstill, with the door of the fire box of the machine open, wiping the perspiration off his face and bowing to the people before him. If I live to be 1000 years old I'll never forget the ride that Frenchman gave me on a piano."—*New Orleans Picayune.*

A unique house is being built in Paris for a private gentleman. It is thus described by the *Daily News* of London: There will be no staircase in it, and yet it will be a house several stories high. This sounds like a paradox, but it is explained in this way: The street in which it is being built is the Rue Muller, which has a steep gradient. A large frontage has been secured, extending to the Rue Lamark. As the ground rises the level of the floors rises, and there are five gradations, equivalent to five stories. It is in this way that visitors to the house will step directly out of the street upon the fifth floor, as well as all the others.

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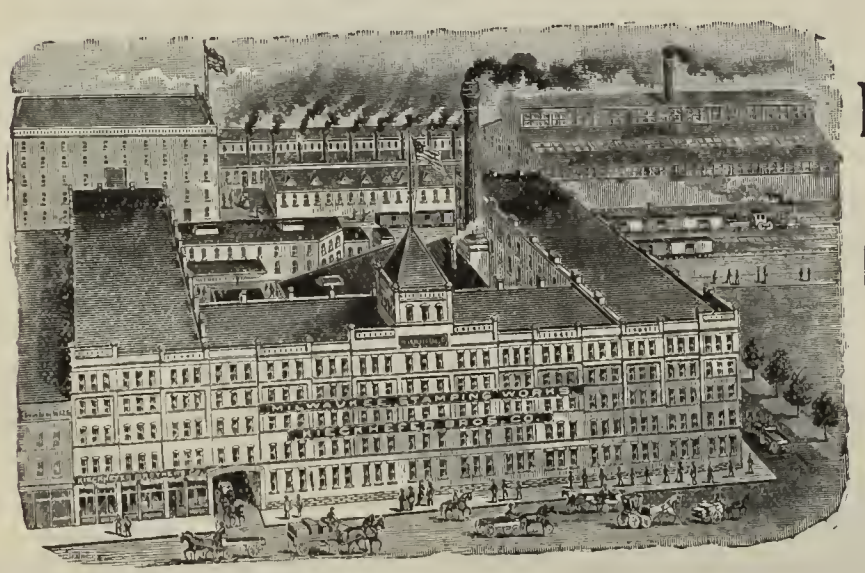
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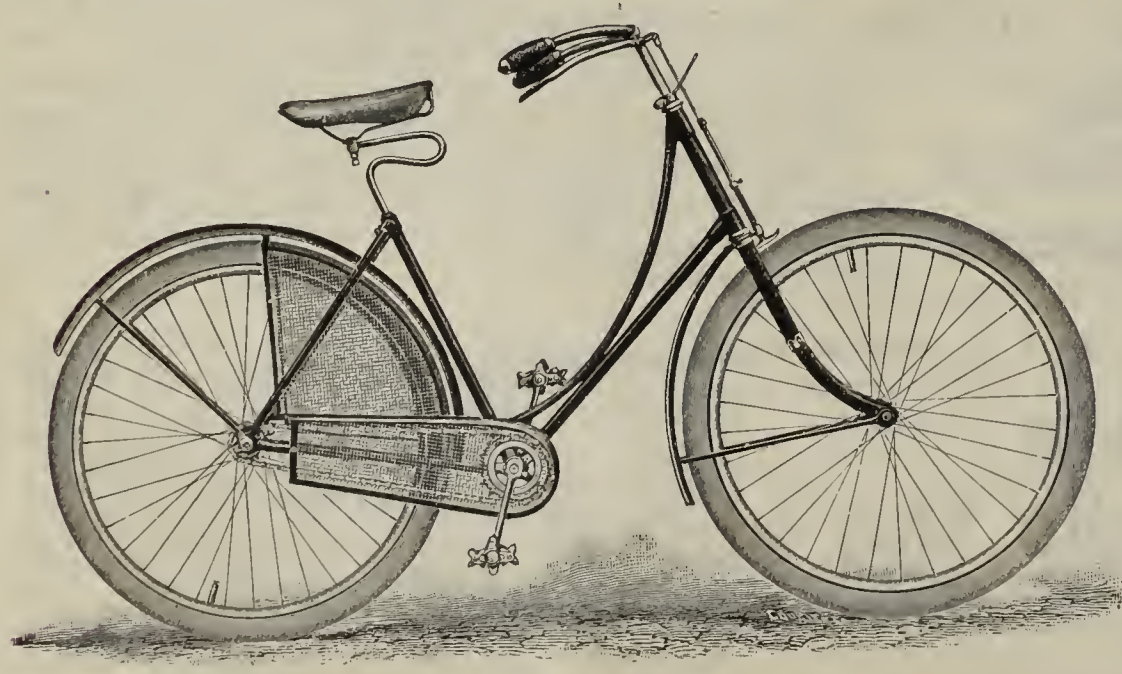
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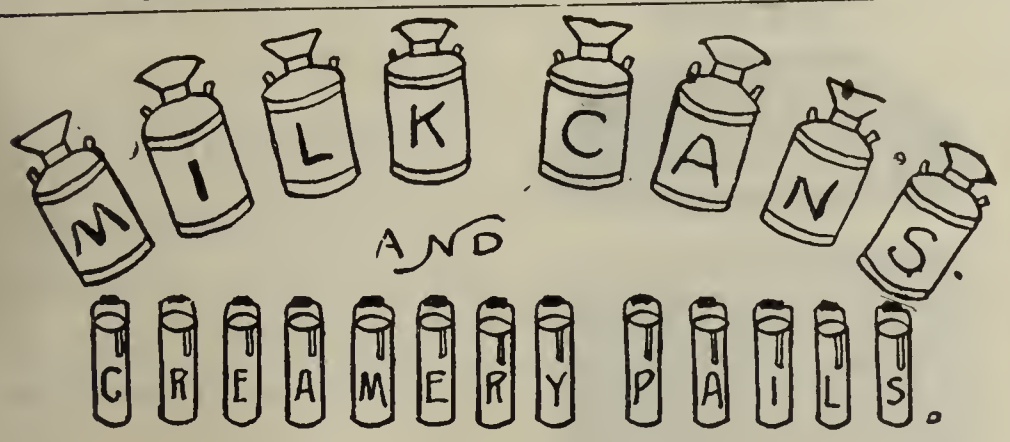
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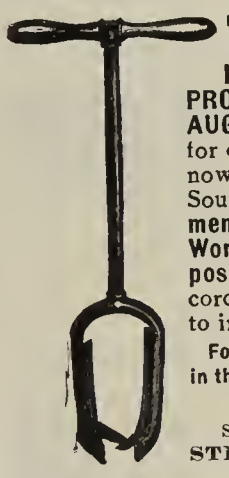
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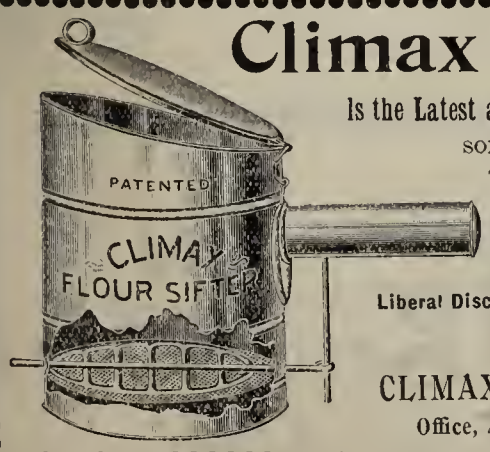
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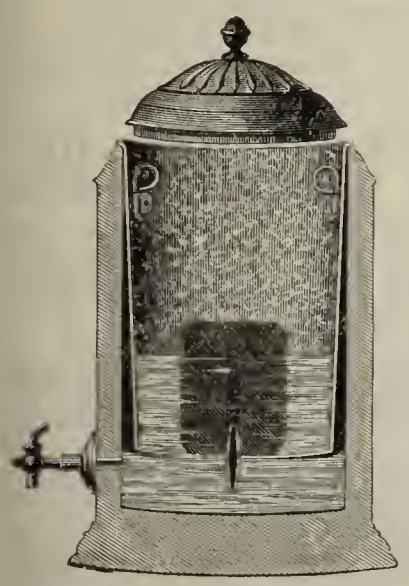
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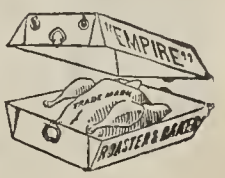
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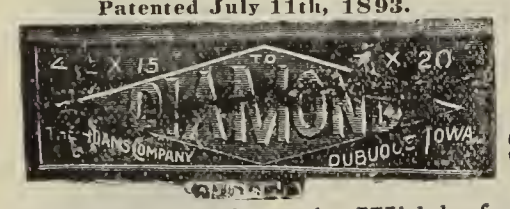
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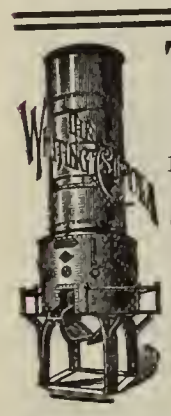


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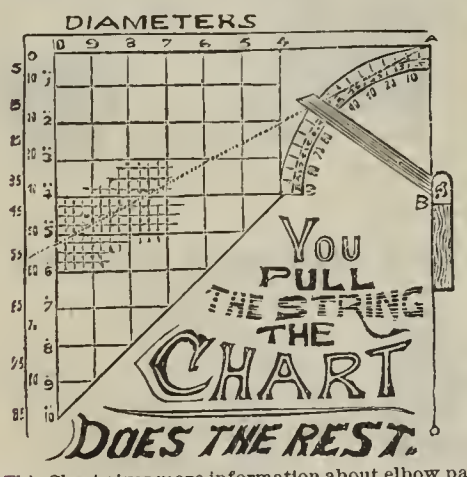
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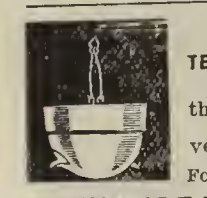
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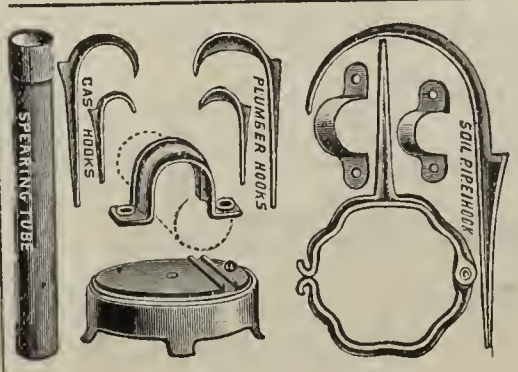
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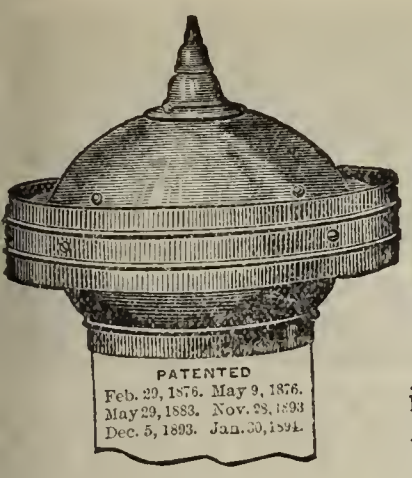
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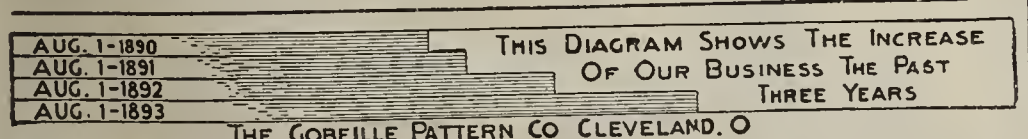
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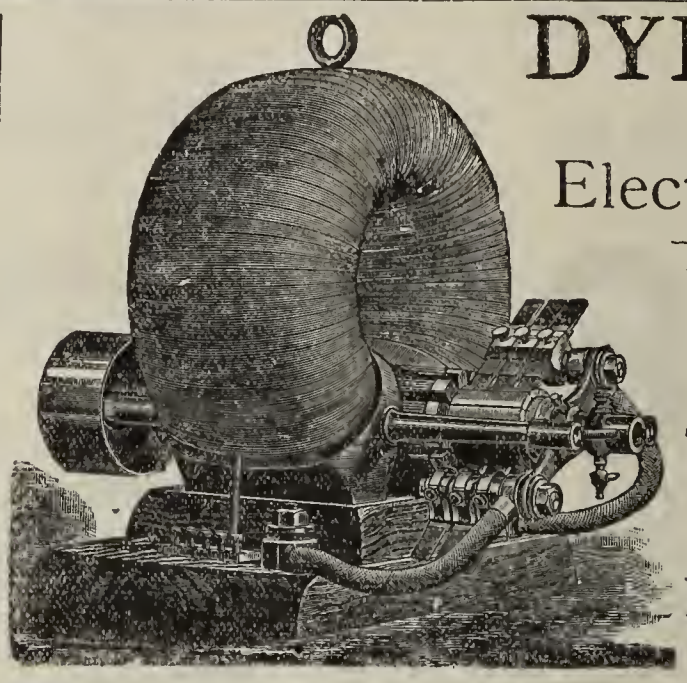
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DURABLE and
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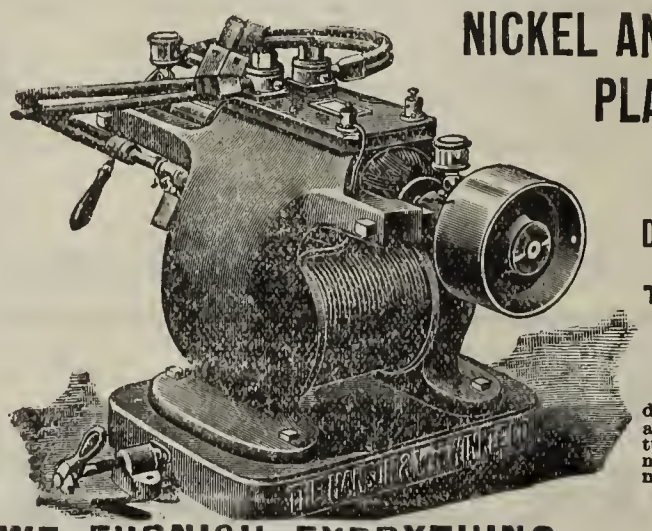
The Best Machine Made.
Satisfaction Guaranteed.

—THE—
Eddy Electric Mfg. Co.
Windsor, Conn

ESTABLISHED 1820. INCORPORATED 1891

The Hanson & Van Winkle Co.,

MANUFACTURERS OF



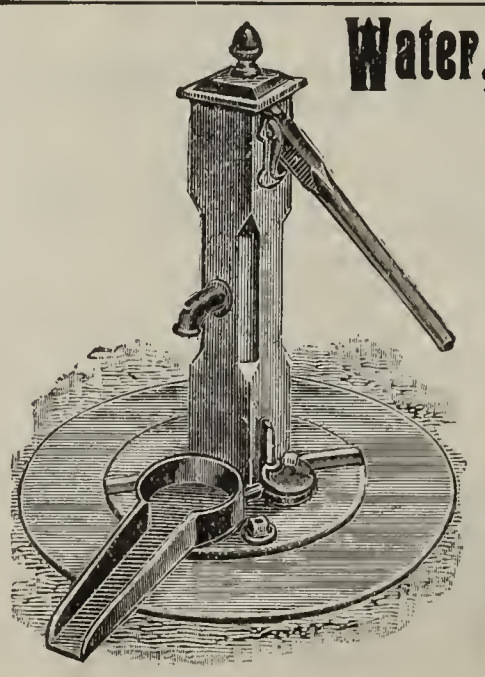
NICKEL AND ELECTRO PLATERS' MATERIAL.

Nickel-Plating Outfits
From $20 upward.
DYNAMO-ELECTRO MACHINES
For all purposes.
The New H. & V. W. Dynamo Machine.
In sizes from No. 1 to No. 5.
FROM $100 TO $500.

These machines will be placed on 30 days' trial with responsible parties and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.

219-221 Market St., Newark, N. J.
81 Liberty St., New York.
85-87 South Canal St., Chicago, Ill.

WE FURNISH EVERYTHING.



Pat. Sept. 12, 1893.

Water, Pure and Undefiled.

The Neatest, Cleanest and most Substantial Cistern and Well Cover ever invented.

It shuts out all possibility of bugs or any kind of vermin getting into the Cistern or Well.

Send for Circulars and Price List.

AGENTS WANTED.

MENEFEE & DeVILBISS,

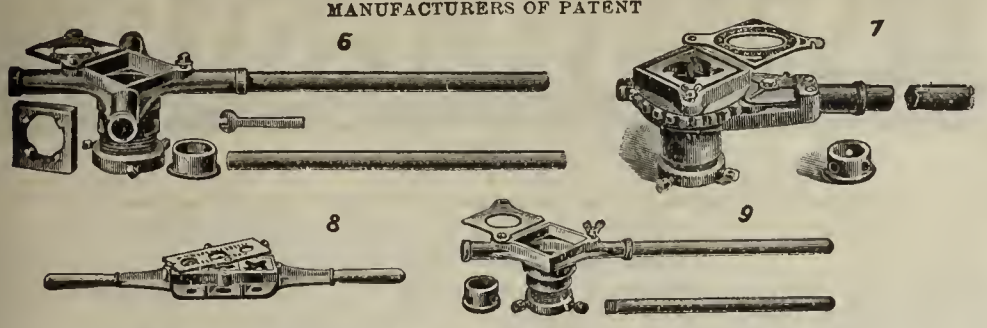
Sole Manufacturers of

The Safety Cistern and Well Cover

FORT WAYNE, IND.

D. SAUNDERS' SONS.

MANUFACTURERS OF PATENT



STOCKS AND DIES.

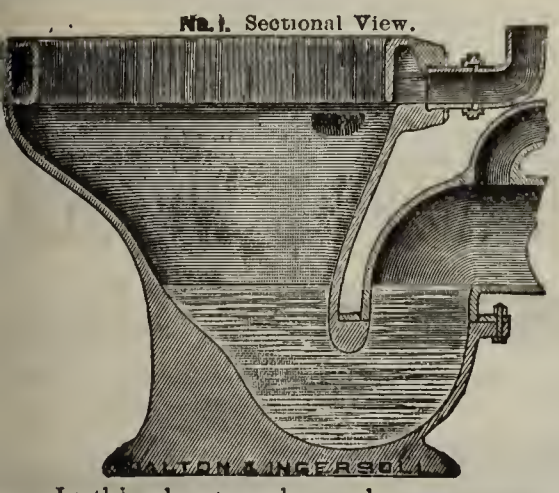
Threading pipe ⅛ inch to 6 inch; the larger sizes have CUTTING-OFF attachment. These tools are light, strong and of superior design and finish; also PIPE threading MACHINES ¼ inch to 16 inch hand or power. Send for catalogue to

27 ATHERTON ST., YONKERS, N. Y.

BOSTON HOPPER WATER CLOSET.

(TRADE-MARK.)

No. 1. Sectional View.



The bowl contains a pool of water 7 x 6 inches. This is a much larger pool of water than has ever been obtained heretofore in the Short Hopper principle; and until now it has been considered an impossibility to construct a Short Hopper with a large standing pool of water that would discharge its contents. This we do in the *Boston Hopper* with the same amount of water that is required to flush an ordinary Short Hopper.

In this closet we have also overcome the objectionable and dangerous connection between the earthen trap and soil pipe. The outlet of the *Boston Hopper* is so constructed that the point of connection between the trap and soil pipe is under the water line, and being submerged it must be absolutely tight against the leakage of sewer air. (For full view see our advertisement last week.)

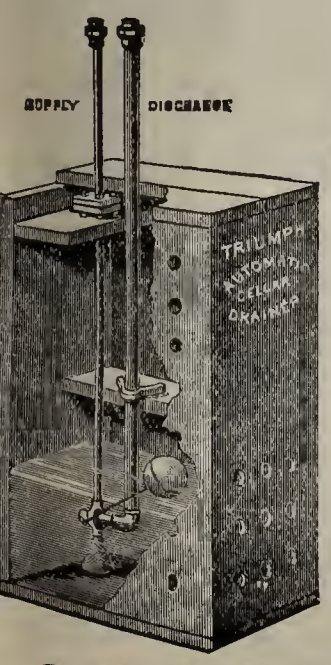
— MANUFACTURED BY —

DALTON-INGERSOLL CO.,

WHOLESALE DEALERS IN PLUMBERS' SUPPLIES,

171, 173 & 175 High Street (Fort Hill Sq.), 55, 57 & 59 Purchase Street,

BOSTON, MASS.



A SURE CURE

—FOR—

WET CELLARS.

The Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

FRIEDENWALD BROS.,

216 N. Holliday St., Baltimore, Md., Sole Mfrs.

Pat. May 19, '85. Pat. May 26, '85. Pat. July 14, '85. Pat. Aug. 8, '86. Pat. Nov. 23, '86.



W. & B. DOUGLAS,

Middletown, Conn.

Branch Warehouses:

85 & 87 John St., New York, and 197 Lake St., Chicago.

GEORGE W. ROBERTSON,

156 N. Fifth St., Philadelphia.

Manufacturers of



PUMPS,

Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants,

Street Washers, &c.



Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS'

REVERSIBLE STEEL & WOOD TRACK HAY CARRIERS

TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



MYERS' FORCE AND LIFT PUMPS



Simple, durable, powerful, easy to operate never affected by frost. Patent GLASS VALVE, will never corrode. Ask your dealer for our goods. Write for catalogue.

F. E. MYERS & BRO. ASHLAND, O.



LEATHER AND RUBBER

WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.



BROUGHTON'S

PATENT

SELF CLOSING

BASIN COCK

EVERY ONE WARRANTED

Send for Circulars.

Stebbins Manufacturing Co., Brightwood, Mass.
SOLE MANUFACTURERS.

THE GREAT BONANZA.

IMMENSE SUCCESS.

Hull's New Double Burner for Tinners and Plumbers.



PRICE, $6.00.

The blue blaze strikes inward meeting in the center, causiug the most terrific fire ever produced from gasoline, hitting the coppers on both sides and bottom. Will heat 5 lb. coppers red hot in 3 minutes. The only burner that will heat 12 lb. coppers fast enough to use. Will melt 10 lb. of lead in 5 minutes. Cannot blow out in the strongest wind. Write for circulars or send $5.00 in postal money for sample furnace,

M. L. HULL,

Cleveland, Ohio.

REDFIELD'S

WROUGHT STEEL HOSE CLAMP.



STRONGER, LIGHTER
And more pliable than a cast clamp.

Perfect Inner Circle Will not break.

Sample and Price on application.

PATENTED.

J. R. CLANCY, - Syracuse, N. Y.

Don't Buy

Maule's "Skeleton" Pipe Die

If You Wish to Avoid

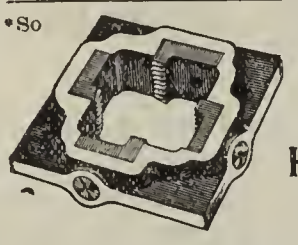
A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;

Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**

Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence of** quality.

If by chance you do not think these points, or the saving of money, objectionable,



So

Send us a **Postal Note for 62 Cents** (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, PA., U. S. A.
SEND FOR CATALOGUE OF THE "SKELETON" PIPE DIE.

TRIMO PIPE WRENCH,

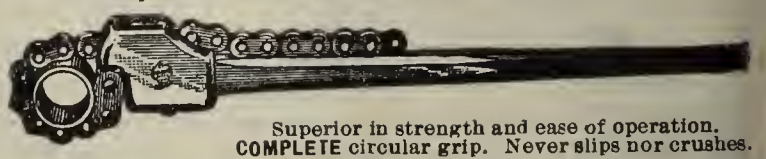


Forged Steel.

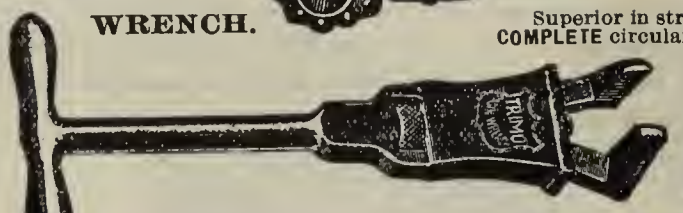
All parts Interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

TRIMO CHAIN PIPE WRENCH.



Superior in strength and ease of operation. COMPLETE circular grip. Never slips nor crushes.



Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.

TRIMO BASIN WRENCH.

TRIMONT MFG. CO., ROXBURY MASS

The "Boyd" Basin.



Made in Ivory Body and all styles of Decoration.

THE ACME OF SANITATION.
HAVE YOU SEEN IT?
IF NOT, GET POSTED.
We Will Post You.

PECK BROS. & CO.,

Fine Sanitary Goods,

47 Cliff St., NEW YORK. 127 Chestnut St., NEW HAVEN, CONN. 259 Wabash Av., CHICAGO. 65 Oliver St, BOSTON.



BOWERS, GALPIN & CO., Binghamton, N. Y.

—MANUFACTURERS—

GALVANIZED. OLD METHOD IX and IC TERNE. COPPER. TROUGHS AND GUTTERS.



Smoke Test Machine

FOR FINDING LEAKS IN

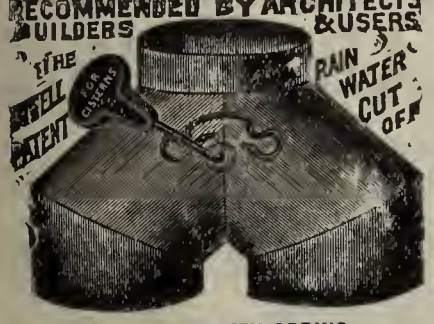
SOIL PIPE.

PRICE $15.00. Write for Circular.

Bailey=Farrell Mfg. Co.,

PITTSBURGH. PA.

THE HOWELL PATENT



SHOWING SAFETY SPRING.

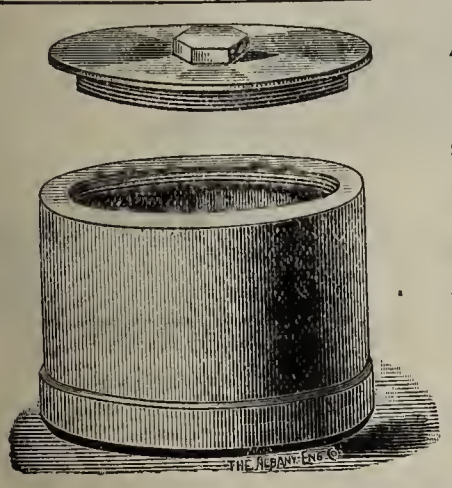
Rain Water **CUT-OFF.**

For turning the water into or off the cistern.

G. W. Howell,
Mfr.,
Covington, Ky.



SHELL REMOVED, SHOWING VALVE



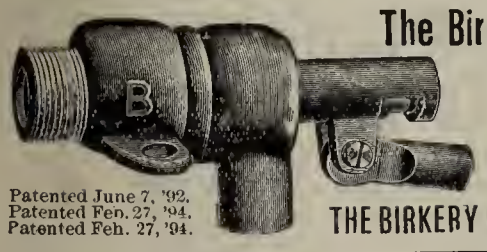
A Common Sense Trap Screw Ferrule

The body is of cast iron in regular pipe sizes, fitting the Hub neatly and making a good wall to calk against. The **COVER** being of **BRASS** cannot unite with the iron and corrosion is prevented by the use of Graphite. A Common Sense Article at half the cost of brass.

THOMAS HYDE,

69 Perry St., ALBANY, N. Y.

FOR SALE BY ALL DEALERS.



The Birkery High Pressure Ball Cock

Is the Best, Cheapest and most Perfect Working Ball Cock ever offered to the public.

It will not Sing or Hammer.

For sale by dealers in Plumbers' Supplies.

Patented June 7, '92.
Patented Feb. 27, '94.
Patented Feb. 27, '94.

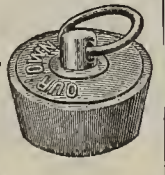
THE BIRKERY MFG. CO., Sole Manufacturers, HARTFORD, CONN.



"OUR OWN" BASIN PLUGS

With Nickel Trimmings are the Neatest and Best.

SAMPLE DOZEN ASSORTED $1.



H. O. CANFIELD,

MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.

CLARK'S ANGLE PLUG FAUCET

For Family Oil Cans, Etc.

(Patent applied for.)



The Faucet is constructed with a Plug set on an angle, making it very convenient, and has a double running thread. The liquid has a direct flow, which obviates oozing out through the threads; in fact, the objectionable points with other styles are overcome.

MANUFACTURED ONLY BY

THE CLARK NOVELTY CO.,

ROCHESTER, N. Y.

COLWELL LEAD COMPANY,

Centre St., and 681 Sixth Ave., Cor. 39th St., New York.

Lead Pipe, Sheet Lead, Shot,

Plumbers', Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrought Iron Pipe of all sizes cut to order





The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating burners.** It is a modern, perfected apparatus warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adjustable burners. Send for catalogue.

C M. KEMP MFG., CO.,
BALTIMORE.

THE CENTENNIAL WATER CUT-OFF
FOR CISTERNS.

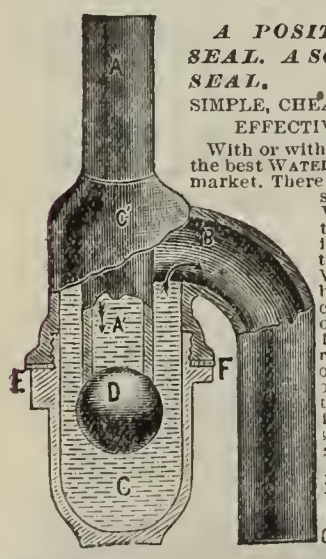
It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.
For sale by the trade.
Ask your jobber for them.



COONEY, SEINER & CO,
Successors to
MYER & COONEY,
Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.
3-inch sample, by mail, 40 cts. In stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:
SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co., New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St Joseph, Mo.

THE BOWER
SEWER GAS TRAP.

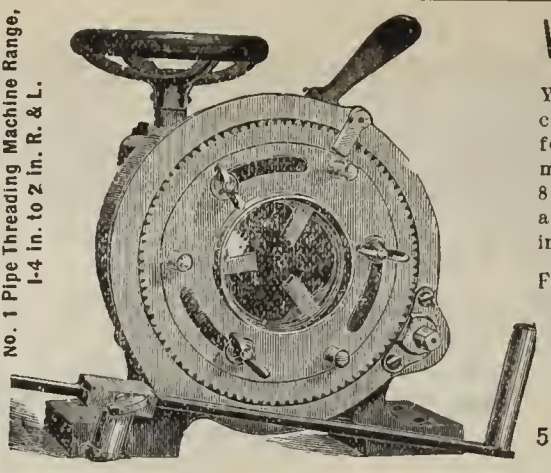


A POSITIVE VALVE SEAL. A SOUND WATER SEAL.
SIMPLE, CHEAP.
EFFECTIVE and DURABLE.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 18-page pamphlet sent free on application.

B. P. BOWER & CO.,
Manufacturers,
Cleveland, Ohio

Chucks The National. All sizes and styles. Pat'd **Reversible Jaws.** Ill'd Catalogue. The Standard Chuck since 1862. Address W. WHITLOCK, 39 Cortlandt St., N. Y. Works, 1300 Hudson, St., Hoboken, N.J.



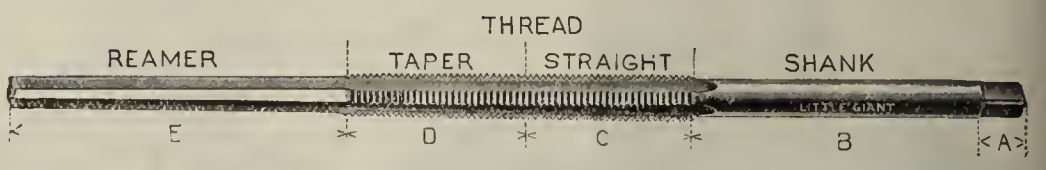
When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

CURTIS & CURTIS,
56 Garden Street, - Bridgeport, Conn.

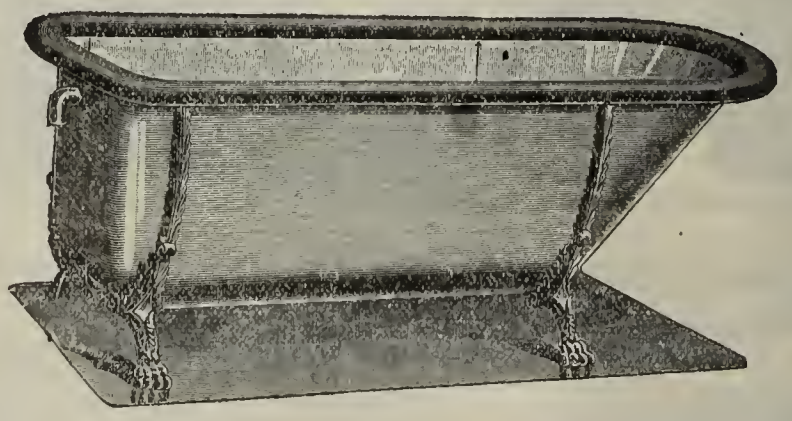
WE MAKE A SPECIALTY
OF
STAY BOLT TAPS.



Parties using this class of taps will do well to cut this out, mark sizes and lengths on same and send to us for prices. We make any size desired and keep in stock a large variety of sizes and lengths, made up in the following proportions: One-third Reamer, One-sixth Taper, One-sixth Thread, One-third Shank.

Manufactured by **WELLS BROS. & CO., GREENFIELD, MASS., U. S. A.**

THE STEEL CLAD BATH.



Steel Clad. Lined with Tinned and Planished Copper. Clean, Durable and Inexpensive.
An Open Sanitary Fixture. For Sale by all Leading Jobbers.

—MANUFACTURED BY—

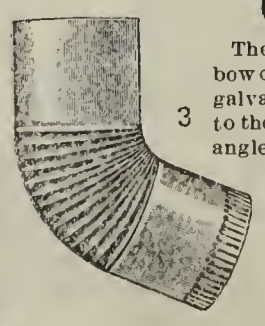
THE STEEL CLAD BATH CO. OF N. Y. AND **THE STEEL BATH MFG. CO.**

W. C. TRACESER, Pres't.
447 to 453 W. 26th St., New York.

GEO. BOOTH, Pres't.
85 & 87 W. Con ress St., Detroit, Mich.

SEND FOR CATALOGUES.

The "O.H." One Piece CONDUCTOR ELBOWS.
PLAIN, ROUND and CORRUGATED

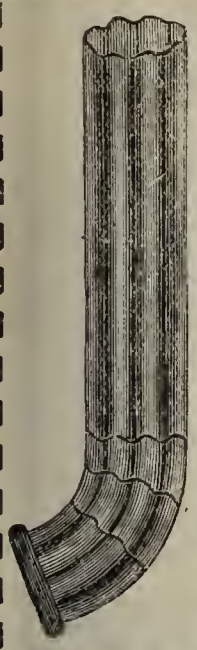


The "O. H." is the strongest and most durable elbow on the market. Made of the best steel plate and galvanized after formation. Prompt attention given to the manufacturing of special elbows of any size, angle or material. Write for prices.

For Sale by all Jobbers of Tinners' Supplies.



THE LAWRENCE-LETTS ELBOW CO., Ltd.,
MANUFACTURERS,
(P. O.) WAVERLY, N. Y.



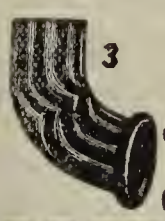
POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested In all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



W. AUSTIN OBDYKE & CO.,

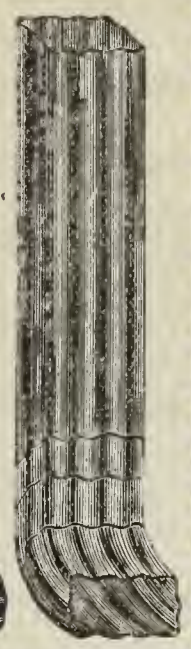
Manufacturers

Office and Works, 237, 239 and 241 Bread St., - PHILADELPHIA, PA.

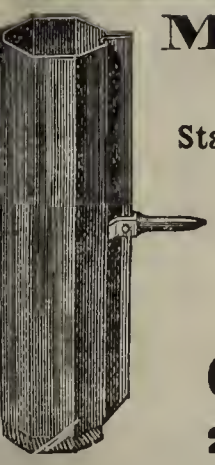
For sale by jobbers and dealers in tinners' and roofers' supplies.

CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.









MARLIN & CO.,

(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

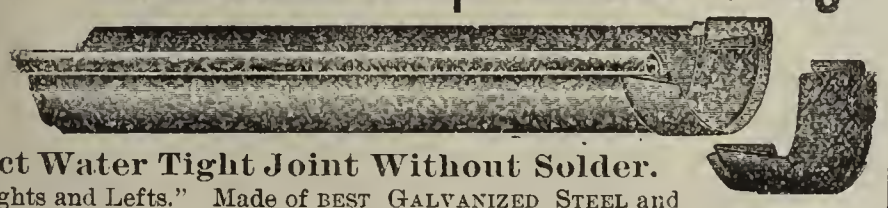
—AND—

GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.

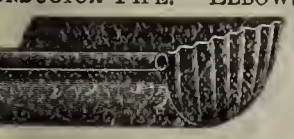
Holton's Patent Detached Slip Joint Eave Trough.

10 FEET LONG.



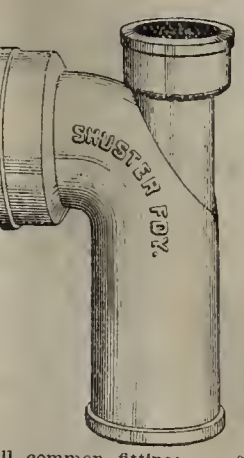
Perfect Water Tight Joint Without Solder.

"No rights and Lefts." Made of BEST GALVANIZED STEEL and N. Also HOLTON'S PATENT "SOLID" END PIECE. PLAIN and CORRUGATED ONDUCTOR PIPE. ELBOWS, SHOES, HANGERS, ETC.



The Niles Mfg. Co., Niles, Ohio.

Mention this paper.



ll common fittings are 2 hes longer on the bead end n those in general use, owing plenty of room for lking joints.

SHUSTER'S

Common Fittings.

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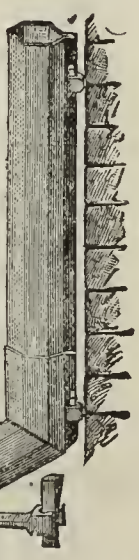
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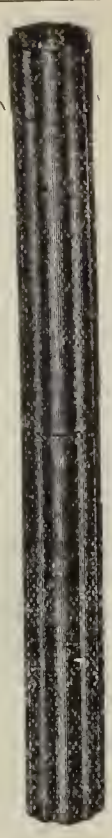
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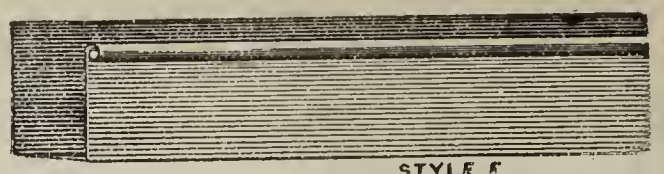
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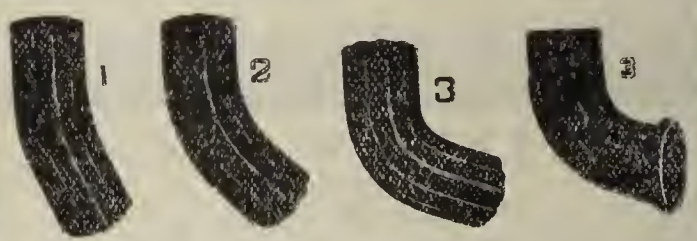
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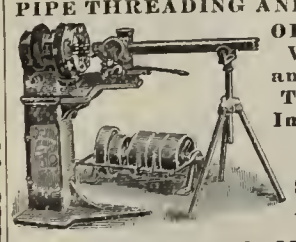
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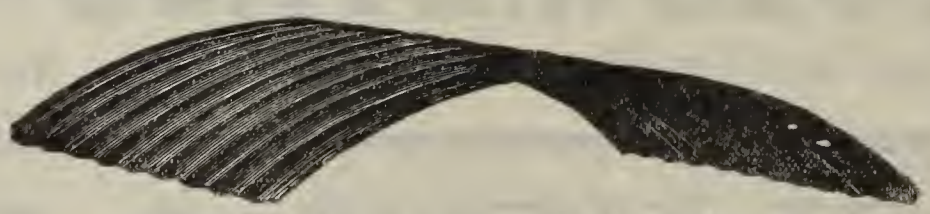
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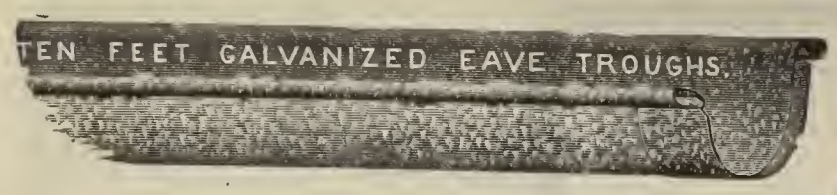
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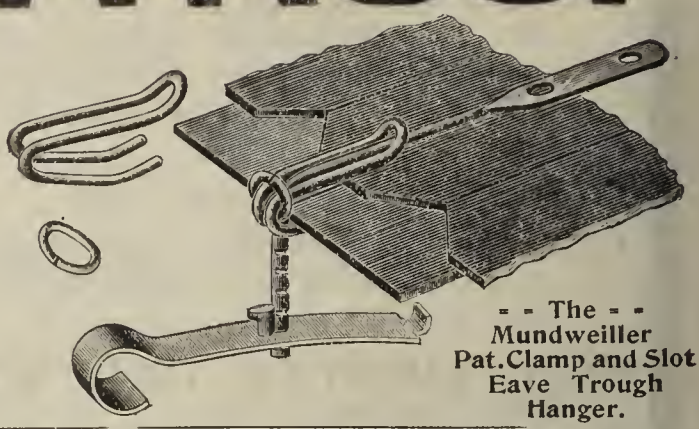
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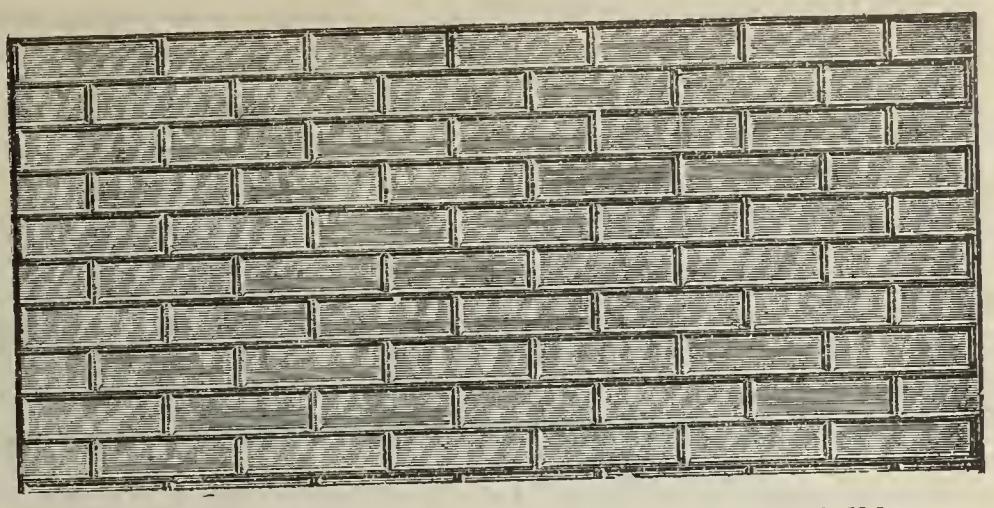
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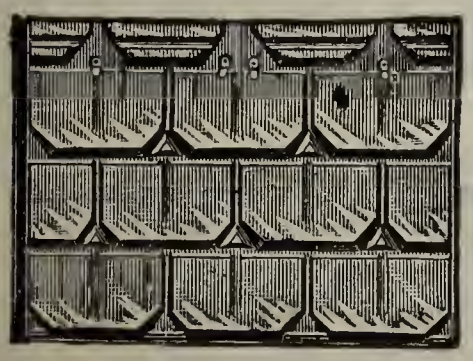
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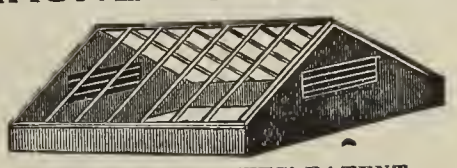
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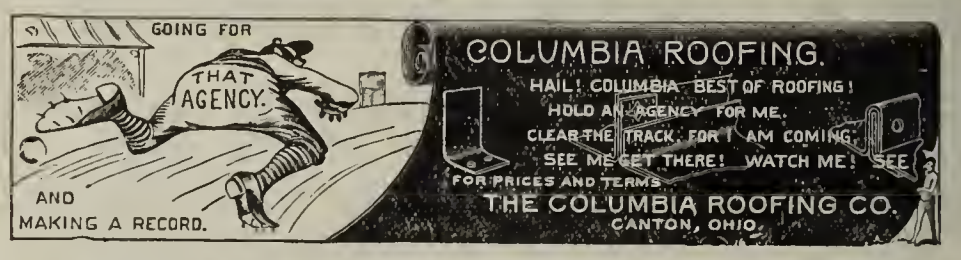
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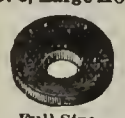
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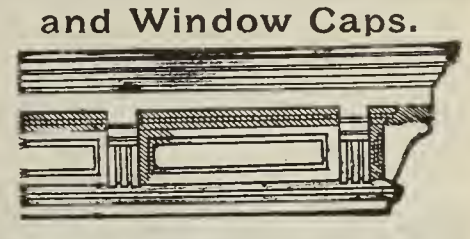
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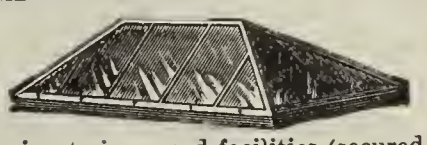
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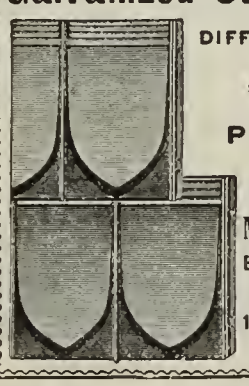


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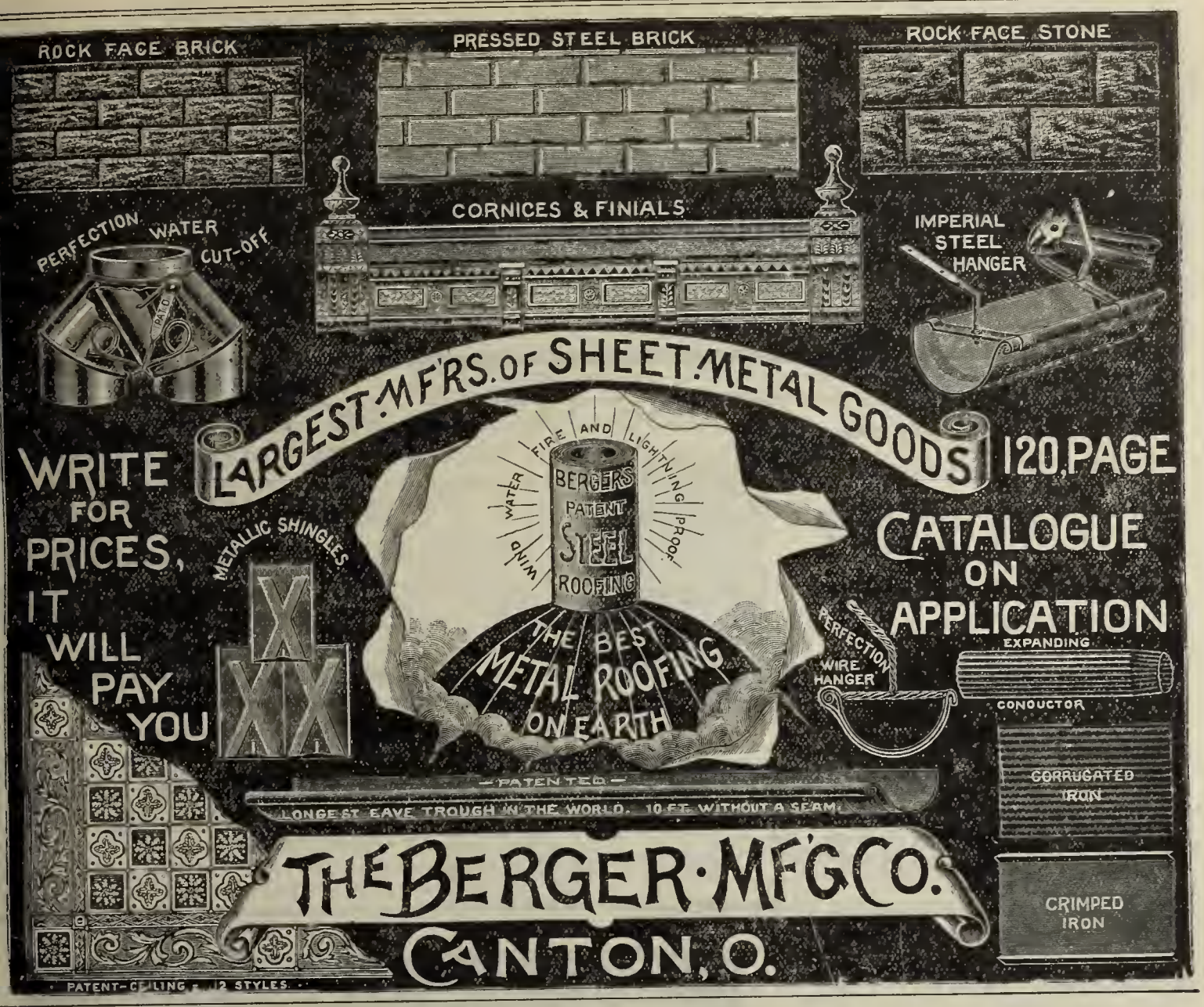
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A: "But they had a much larger capital in use."

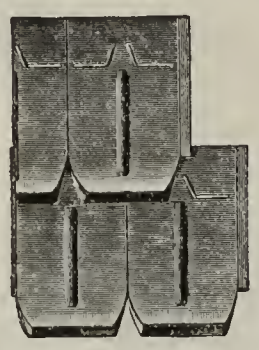
B: "Yes, some one else's capital, which they could not borrow at less than 7 per cent., and that is, as I said, as much as they can make in straight commercial business these times. E. & Co. should have consumed their capital in 23 months by their extravagant living. Not fail? How would they help it?"

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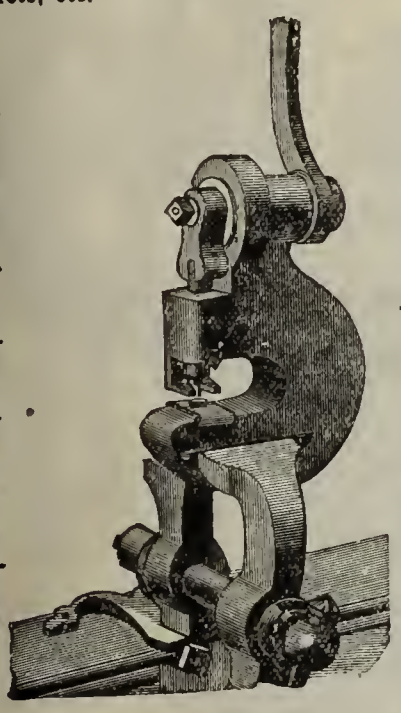
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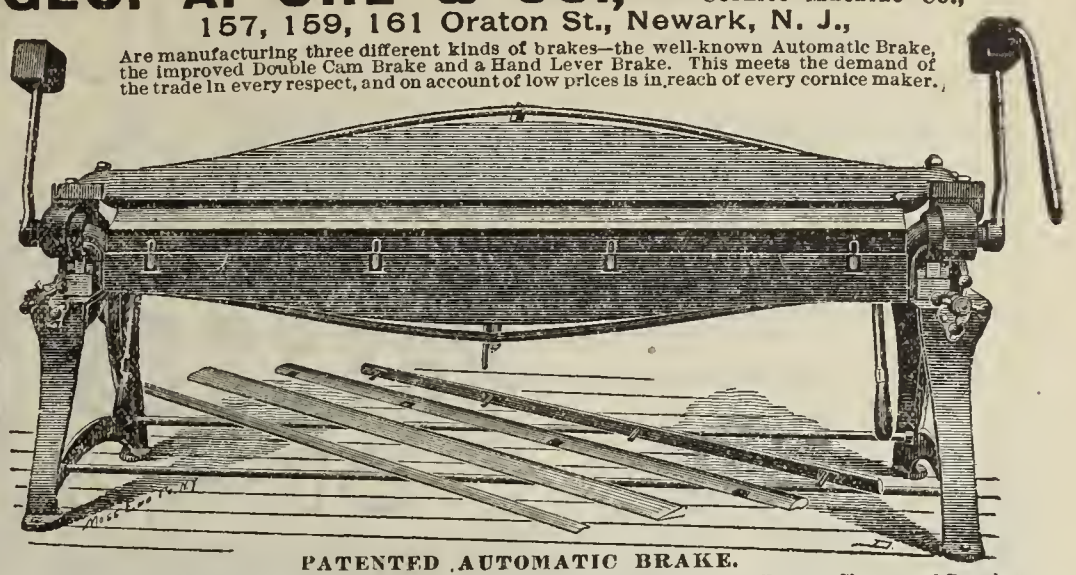
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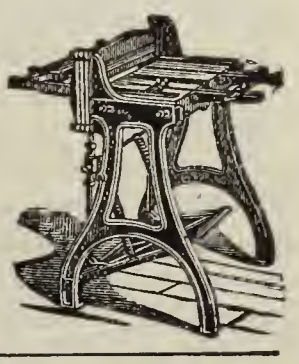
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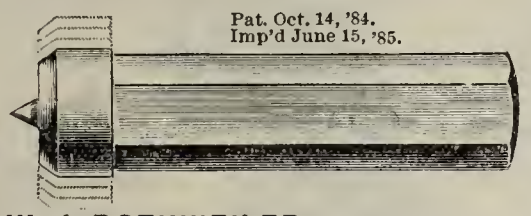
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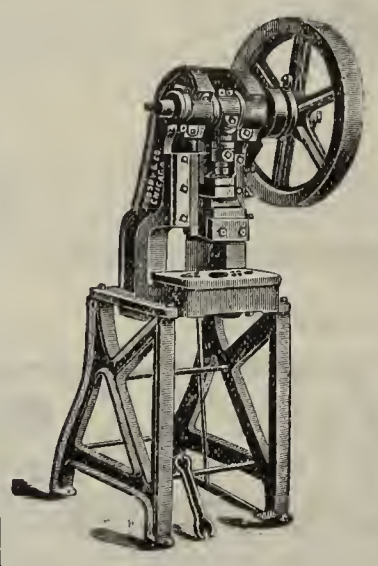
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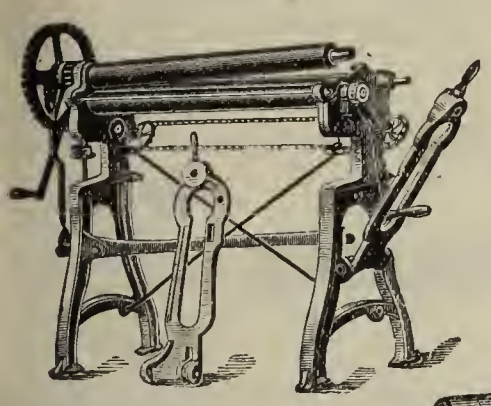
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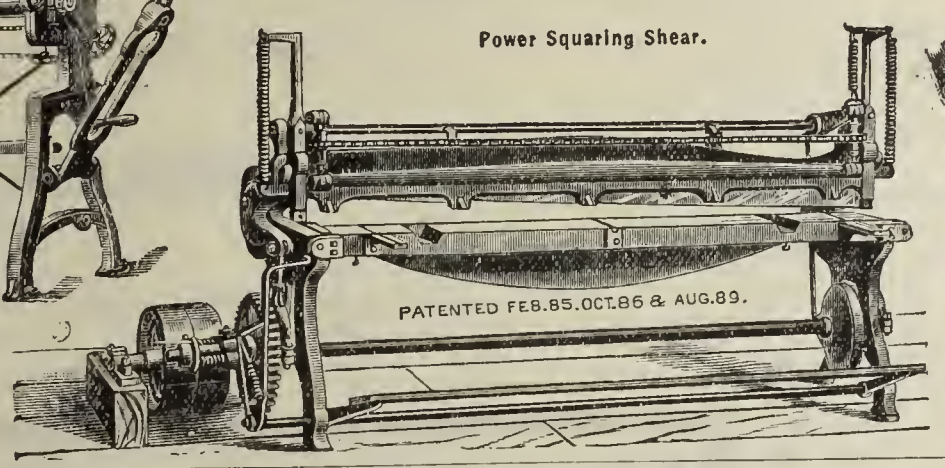
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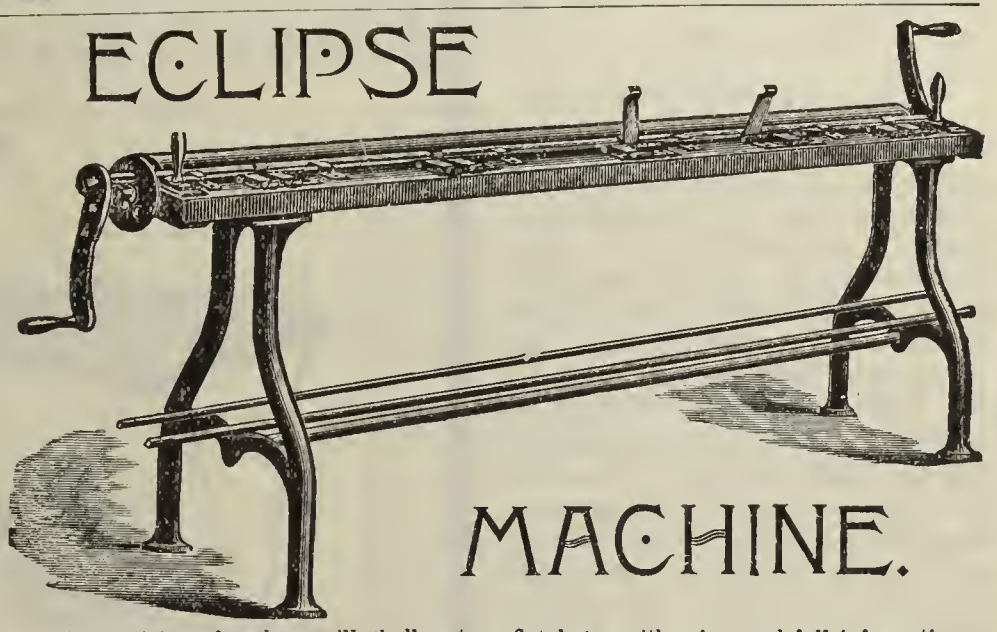
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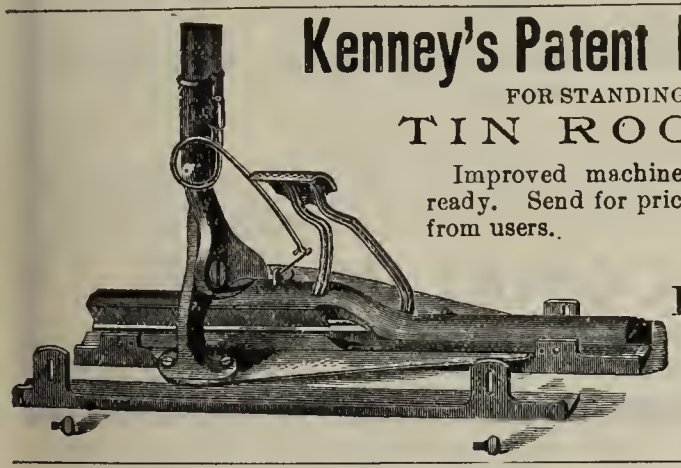
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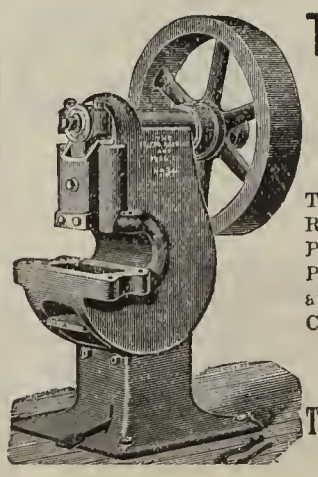
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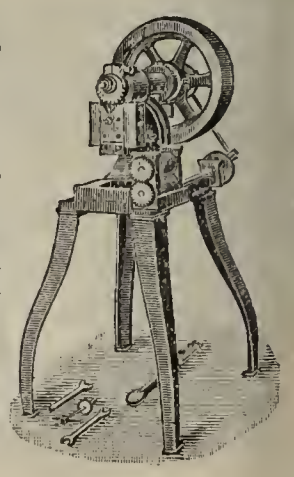
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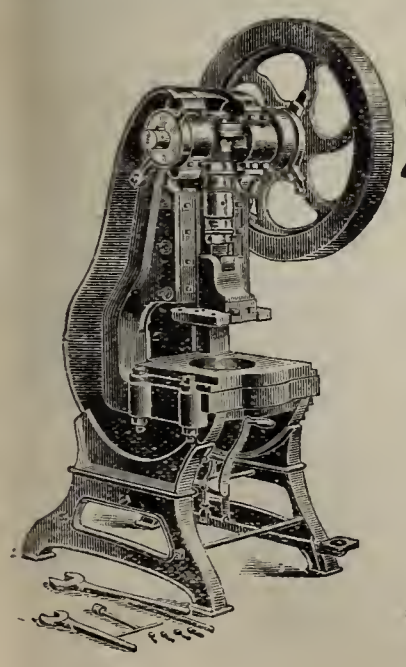
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Sands, Thos., Nashua, N. H.

Gas Heaters—*See Stoves and Range Gas.*

Gas Governors.
N. Y. Gas Saving Co., Decker Bldg., Union Square, N. Y.

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Grain Measures.
Bellaire Stamping Co., Harvey, Ill.

Grates.
Jackson, W., Sons, 246 Front St., N. Y.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Hardware Specialties.
Philadelphia Hardware & Malleable Iron Works, Philadelphia, Pa.

Heaters, Steam and Hot-Water.
Barstow Stove Co., Providence, R. I.
Bell, Geo. H. & Co., 114-116 Nassau St , New York.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Fuller & Warren Co , Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Hot Water Heater Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Putnam Foundry & Machine Co., Putnam Conn.
Raymond & Campbell Mfg. Co., Middletown, Pa.
Smith Co., H. B. 137 Centre St., N. Y.
Weathered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

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Griswold Mfg. Co., Erie, Pa.

Hose Clamps.
Clancy, J. R., Syracuse, N. Y.

Iron, Galvanized Sheet.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Cort, M. H., 9 Burling Slip, N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry & Clark, 535-547 West 15th St., New York.
Moorhead-McCleane Co., Pittsburgh, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittshurgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

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Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnatl, O.
Gummey, Sperling & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphi Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Moorhead-McCleane Co., Pittshurgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittshurgh, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
U. S. Iron & Tin Plate Mfg. Co., Demmler, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

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Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
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Barnum, E. T., Detroit, Mich.

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Hansou & Van Winkle Co., Newark, N. J.

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Central Oilgas Stove Co., Boston. Mass
Coldwater Oil Stove Co., Coldwater, Mich.
Electric Oil Stove Co , Homer, Mich.
Glazier Stove Co., Chelsea, Mich.
Perry Stove Co , Albany, N. Y.
Rochester Lamp Co., 42 Park Place, N. Y.

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Colwell Lead Co., 63 Centre St., N. Y.

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Marble.
Holley, C. E. & Co., Cincinnatl, Ohio.

Metal Ceilings.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.
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Sanborn, J., 217 Water St., N. Y.

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Lupton's, David Sons, Philadelphia, Pa

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Munsell, Eugene & Co., 218 Water St., N. Y.
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Schoonmaker, A. O , 158 William St., New York.

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Mica Mfg. Co., 89 Fulton St., N. Y.

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Lambert, Stoughton & Cooper, Philadelphia, Pa.

Pant Stretchers.
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Howson & Howson, Philadelphia, Pa.
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Wayne, Jos. W., Cincinnatl, O.

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Allen's Cornice & Corrugating Works, Chicago, Ill.
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Berger Mfg Co., Canton, O.
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Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O
Columbia Corrugating Mfg. Co., Niles, O
Columbia Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
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Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
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Bangor Excelsior Slate Co., Bangor, Pa
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Johnson, E. J. & Co., 88 Park Row, N.Y
Peerless Slate Co., Delta, Pa.
Rising & Nelson, West Pawlet, Vt.

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Millar, C. & Son, Utica, N. Y.

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Correspondence School of Mechanics, Scranton, Pa.

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Brombacher's Sons, Jacob, 30 Cliff St N. Y.
Clough, R. M., Tolland, Conn.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Eclipse Machine Co., Troy, N. Y.

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Ferracute Machine Co., Bridgeton
Indianapolis Elbow Co., Indianapolis Ind.
Keene, Geo. C. & Co., Cincinnati, O.
Michigan Stove Co., Chicago, Ill.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Stark Machine & Tool Co., Buffalo N. Y.
Stiles & Parker Press Co., Brooklyn N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co. Toledo, O.

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Berger Mfg. Co., Canton, O.
Bischoff, F. F. & Co., Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Thorn Shingle and Ornament Co. Philadelphia, Pa.
Van Noorden, E. & Co. Boston, Mass.

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Colwell Lead Co., 63 Centre St., N. Y.

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Rasner & Dinger, Pittsburgh, Pa.

Slater's Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 52 John St., N. Y.
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N. Y
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N. & G. Co., Philadelphia, P

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Knox & Stonier Arch. Sheet Metal Ornament Co., Toulon, Ill.
Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Nason Mfg. Co., 71 Beekman St., N. Y.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Dixon, Jos. Crucible Co., Jersey City N. J.
Globe Ventilator Co., Troy, N. Y.
Nubian Iron Enamel Co., Chicago, Ill.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Cement.
Troy Paint & Color Works, Troy, N. Y

Stove Linings.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Bascom, H. Clay, Troy, N. Y.
Caiely, Edw. L., Philadelphia, Pa.
Cincinnati Pattern Wks., Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, O.
Gobielle, W. M., Cleveland, Ohio.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

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Cheney, S. & Son., Manlius, N. Y.
Stearns, E. C. & Co., Syracuse, N. Y.

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Brauer, A. G., St. Louis, Mo.
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Troy Nickel Works, Troy, N. Y.

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Chicago & Erie Stove Co., Erie, Pa.
Dippo Mfg. Co., Chagrin Falls, Ohio.
Eclipse Stove Co., Mansfield, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., Chicago, Ill.
Klaine, F. A. & Co., Cincinnati, O.
Marion Stove Co., Marion, Ind.
Michigan Stove Co., Chicago, Ill.
Miller, Wm., Range & Furnace Co., Cincinnati, Ohio.
Peninsular Stove Co., Detroit, Mich.
Raymond & Campbell Mfg. Co., Middletown, Pa.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Stamford Foundry Co., Stamford, Conn.
Taplin, Rice & Co., Akron, O.
Thatcher Furnace Co., 33 Peck Slip, N. Y.
Union Stove Works, 70 Beekman St. N. Y.
Van, John, Range Co., Cincinnati, O.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass
Glazier Stove Co., Chelsea, Mich.
Milwaukee Gas Stove Co., Milwaukee, Wis.
Perry Stove Co., Albany, N. Y.
Union Stove Works, 70 Beekman St., N. Y.

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Central Oilgas Stove Co., Boston, Mass
Clark, Geo. M. & Co., Chicago, Ill
Coldwater Oil Stove Co., Coldwater, Mich.
Standard Lighting Co., Cleveland, O
Electric Oil Stove Co, Homer, Mich.
Ellwood Gas Stove and Stamping Co. Ellwood City, Pa.
Glazier Stove Co., Chelsea, Mich.
Luther & Lederhos, 30 Cliff St., N. Y. City.
Perry Stove Co., Albany, N. Y.
Ringen Stove Co., St. Louis, Mo.
Rochester Lamp Co., 42 Park Place, N. Y.
Schneider & Trenkamp Co., Cleveland, O.
Troy Oil Stove Co., Troy, N. Y.

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Ideal Strainer Co., Boston, Mass.

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Calvert, P. B. & Co., Philadelphia, Pa.
Cleveland Tin Plate Co., Cleveland, O.
Coe, Jas. A. & Co., Newark, N. J.
Cort, M H, 9 Burling Slip, N. Y.
Dunlap, John Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Lawson, F. H. & Co., Cincinnati, O.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
McKinley Tin Plate Co., Wilkinsburg, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
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Moorhead-McCleane Co., Pittsburgh, Pa.
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Philadelphia Tin Plate Co., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
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Wheeler, E. S & Co., New Haven, Ct.

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Sands, Thomas, Nashua, N. H.

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Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.
Trimont Mfg. Co., Roxbury, Mass.
Wells Bros & Co., Greenfield, Mass.

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Berger Bros., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind.
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Bruce & Cook, 186 to 190 Water St., N. Y.
Covert Mfg Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J
Keene, Geo. C. & Co., Cincinnati, O
Lawson, F. H. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York
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Ruth, Patterson & Ruth, Alliance, O.
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Water Heaters.
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Menefee & DeVilbiss, Fort Wayne, Ind.

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Trimont Mfg. Co., Roxbury, Mass.

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THE METAL WORKER

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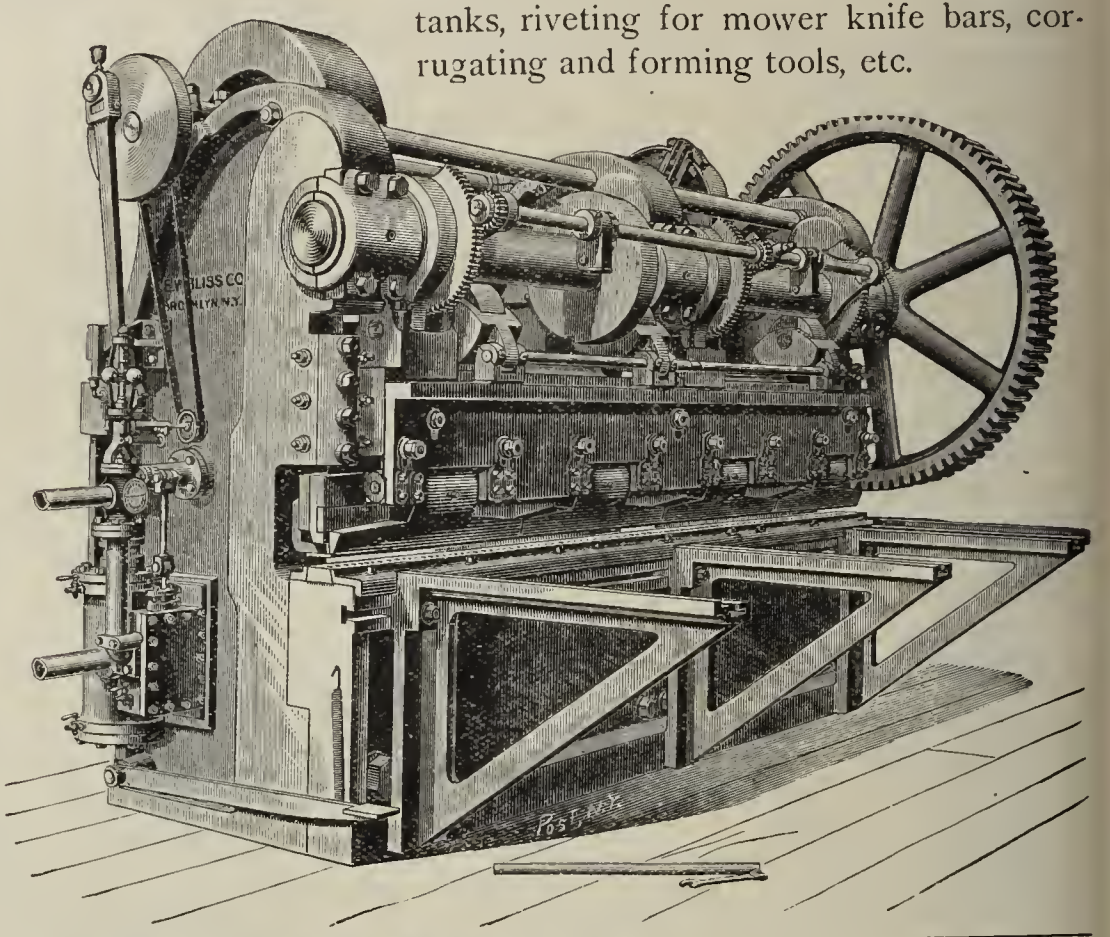
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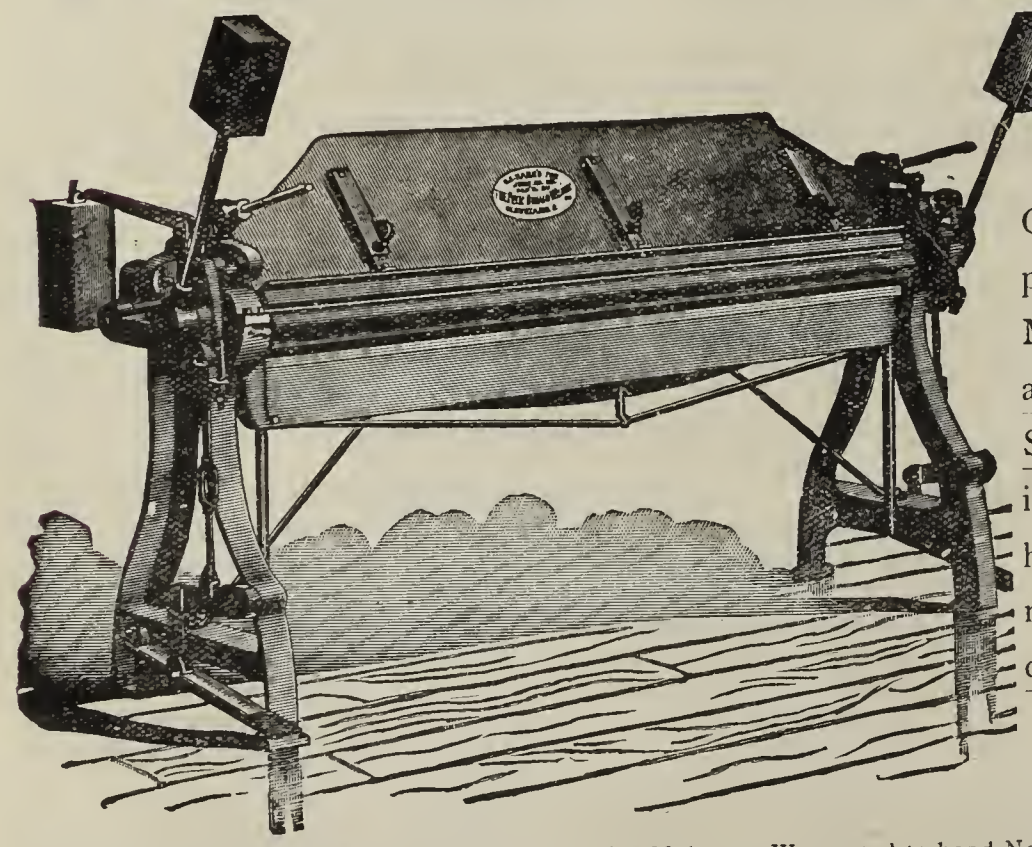
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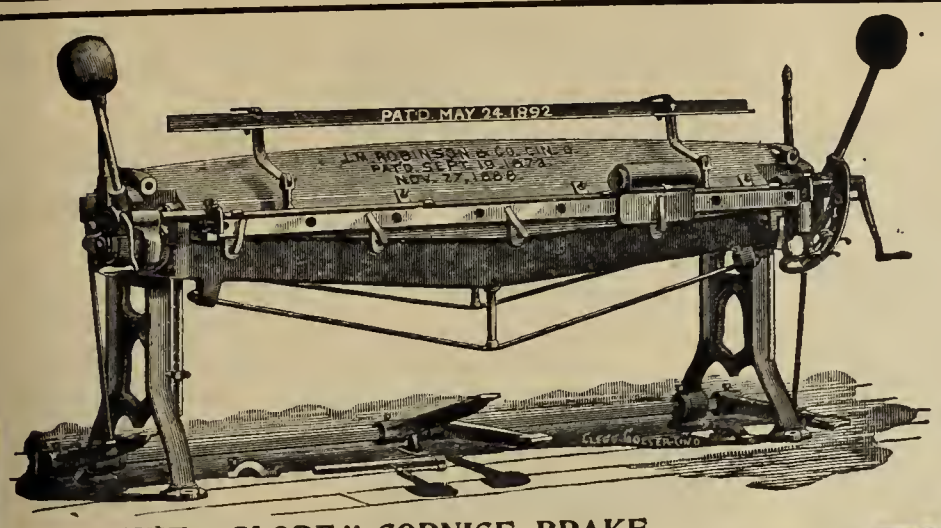


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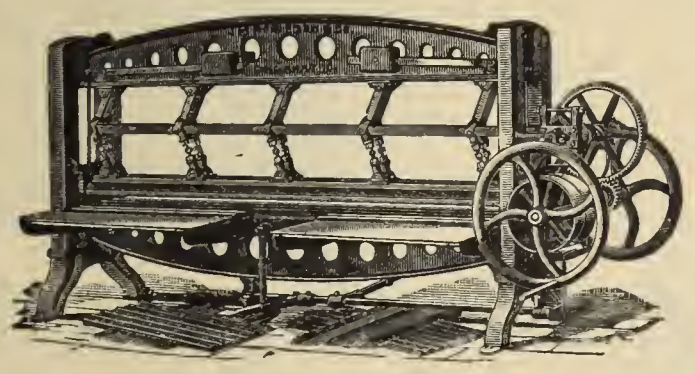


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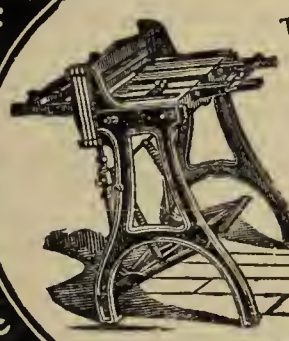
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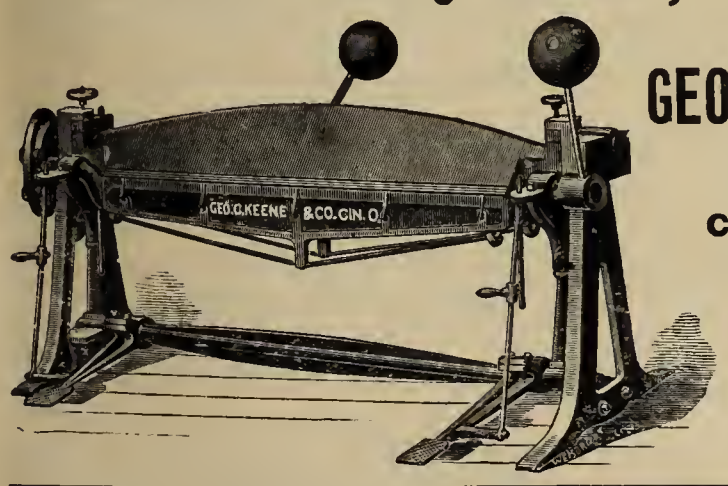
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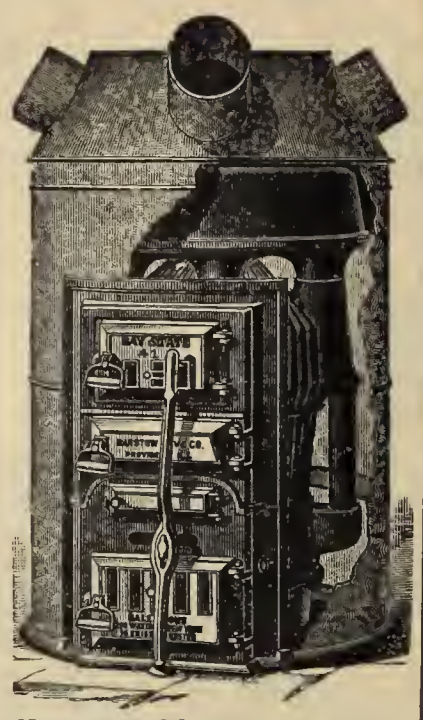
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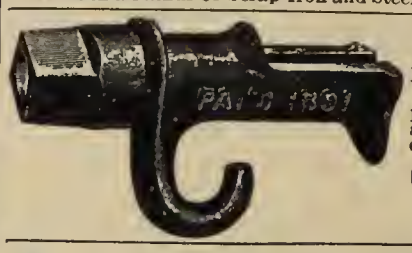
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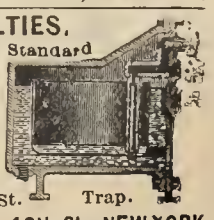
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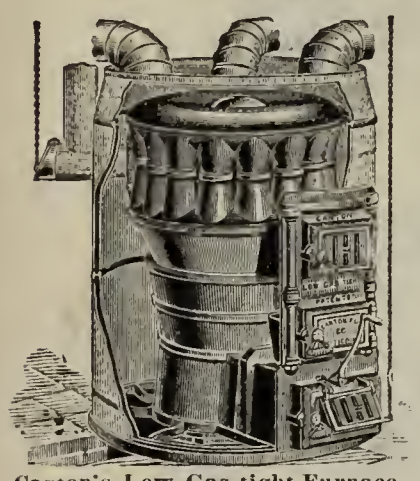


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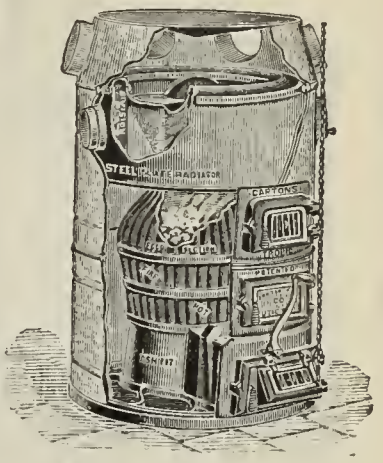
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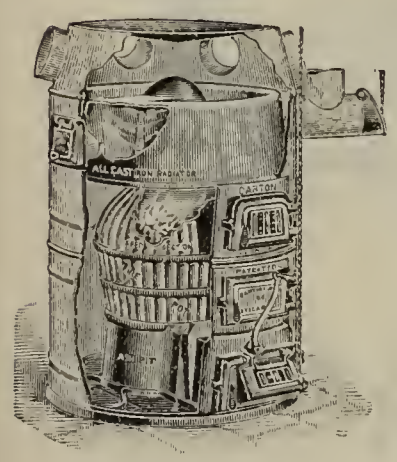
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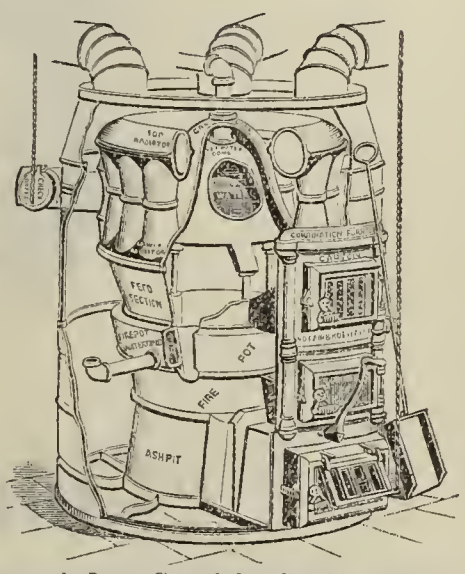
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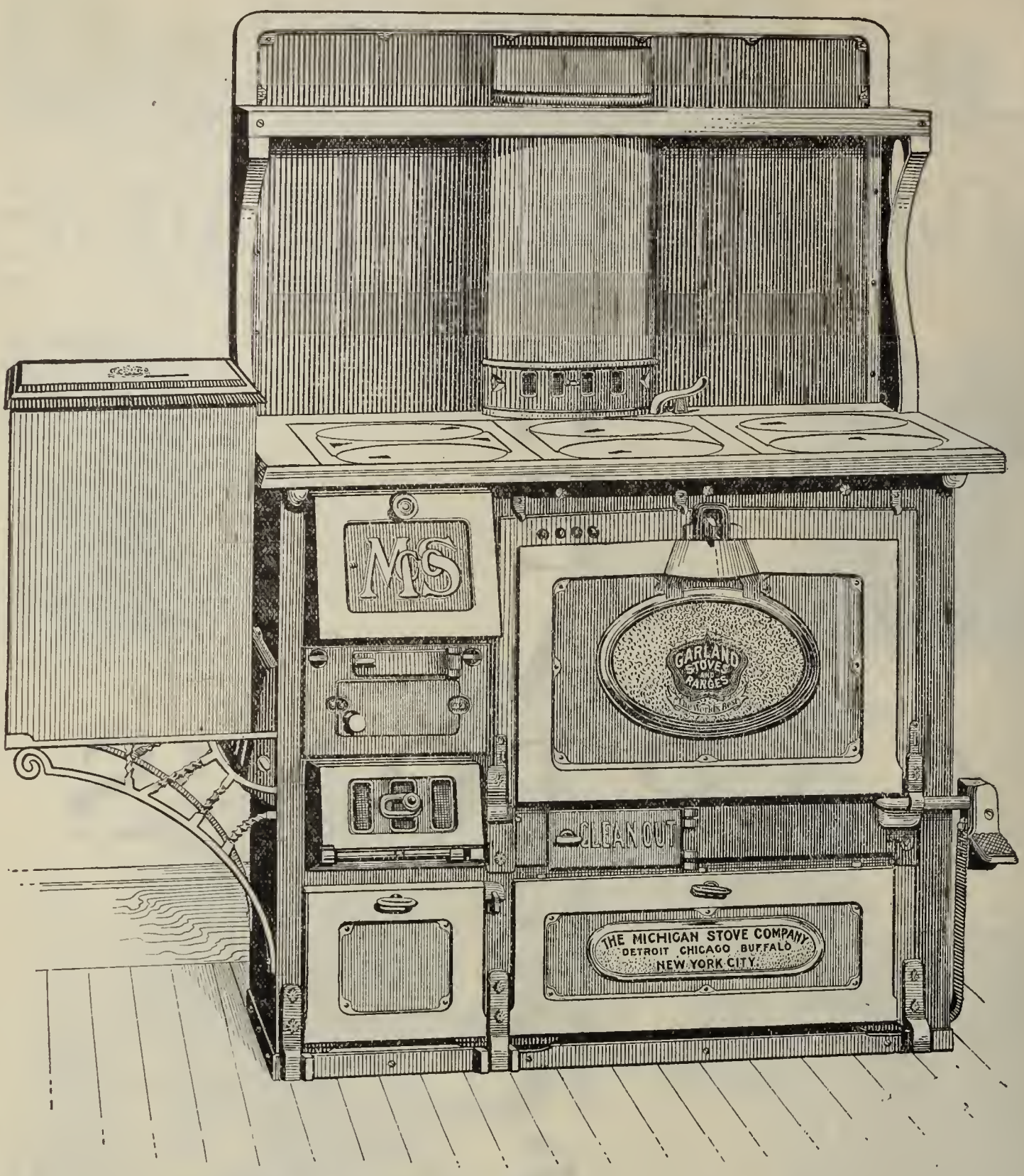
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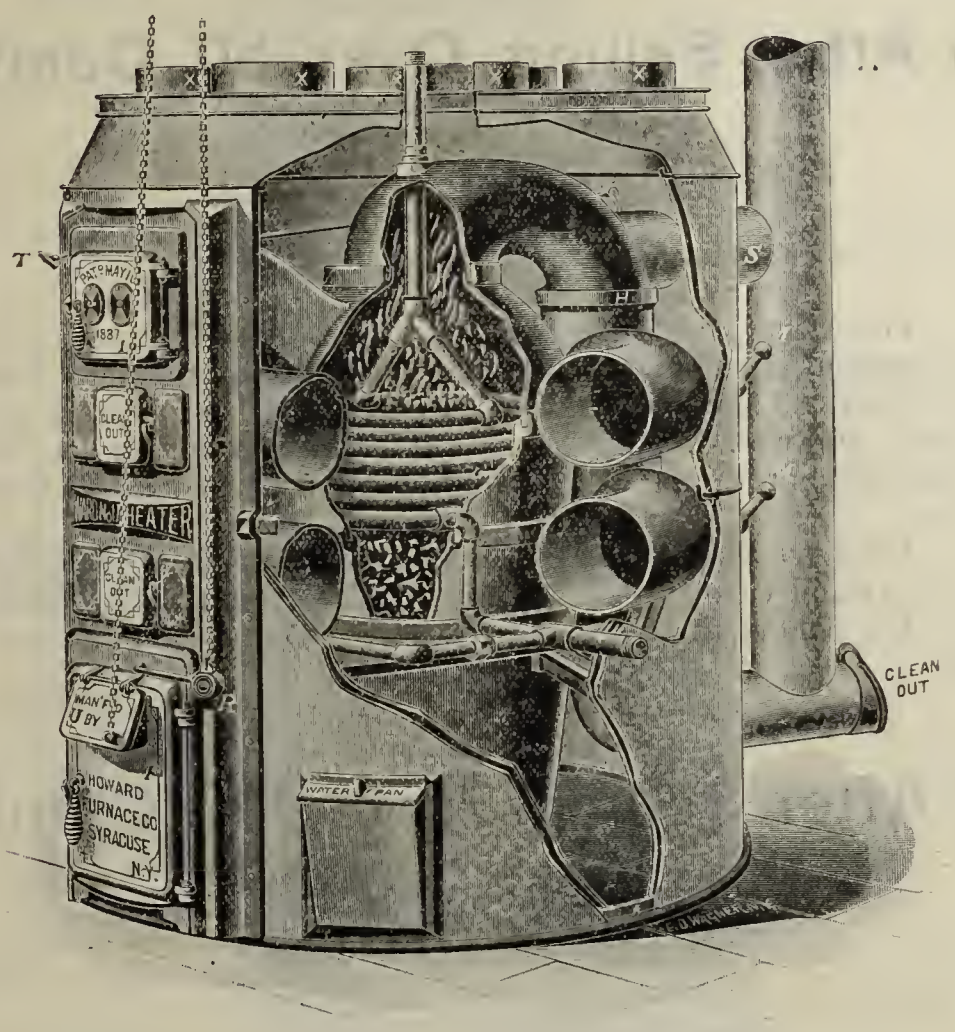
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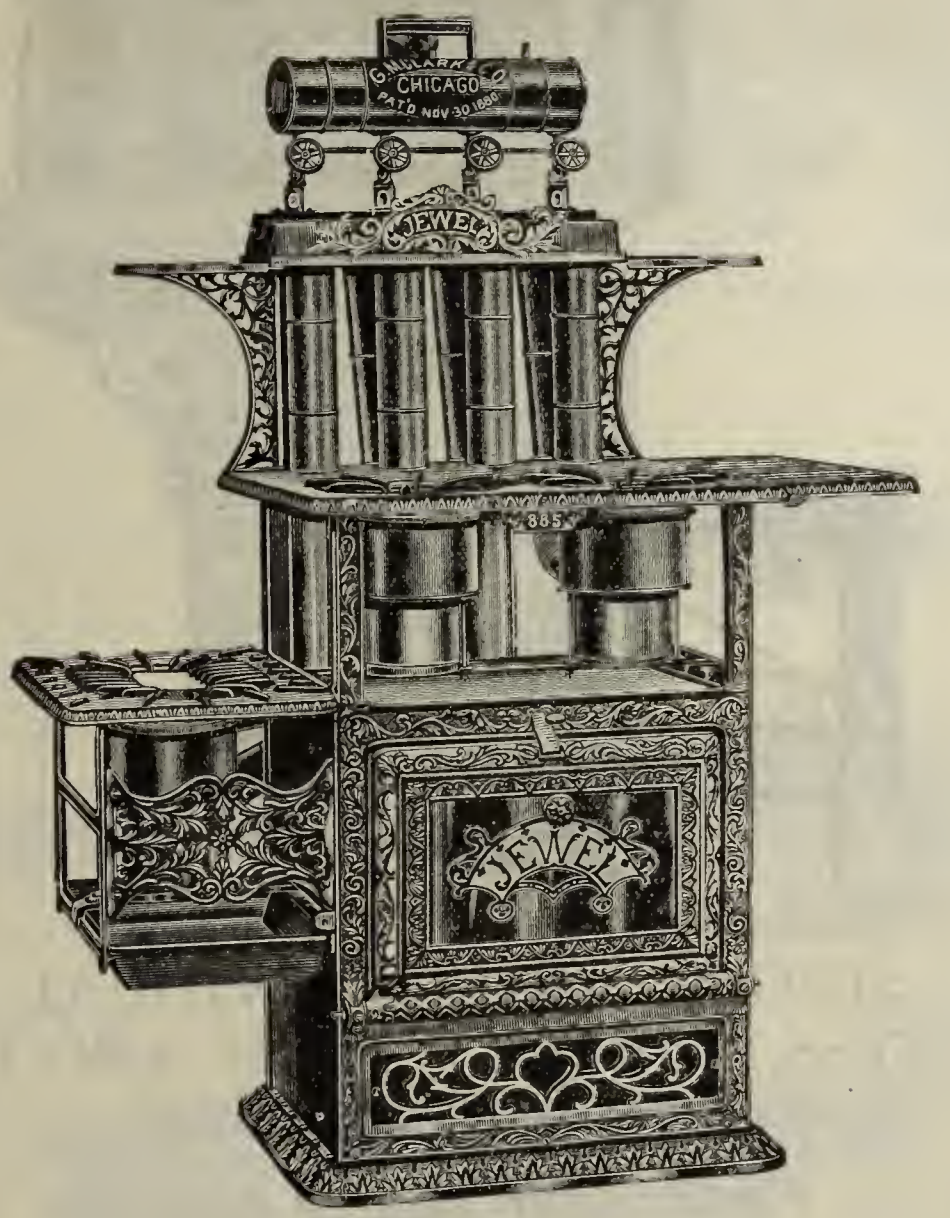
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A. BALDWIN & CO., Ltd., New Orleans, La., Louisiana.
KEE & BURKE, Ft. Worth, Tex., Texas and Arkansas.
CHAS. C. HEATH & CO., Baltimore, Md., Maryland, Virginia, North and South Carolina.
A. EBERLY'S SONS, Washington, D. C., District of Columbia.
NAYLOR & UNIACKE, Philadelphia, Pa., Philadelphia and surroundings.
THE PERRY STOVE CO., Albany, N. Y., New York and New England States.
E. H. HUENEFELD, Cincinnati, O., Kentucky (except Louisville), extreme Southern Ohio, and Indiana River towns.
BRADLEY & MUNK, Columbus, O., Columbus and surroundings.
WEBER & GEBHART, Dayton, O., Dayton and surroundings.
WOOLDRIDGE STOVE CO., Memphis, Tenn., Tennessee.
McDONALD & WILLSON, Toronto, Ont., Can., Canadian Agents.

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Monarch

Vapor Stoves

For '94

Are all new patterns, design and construction, yet embody nothing that has not been practically tested and proven perfect in every detail.

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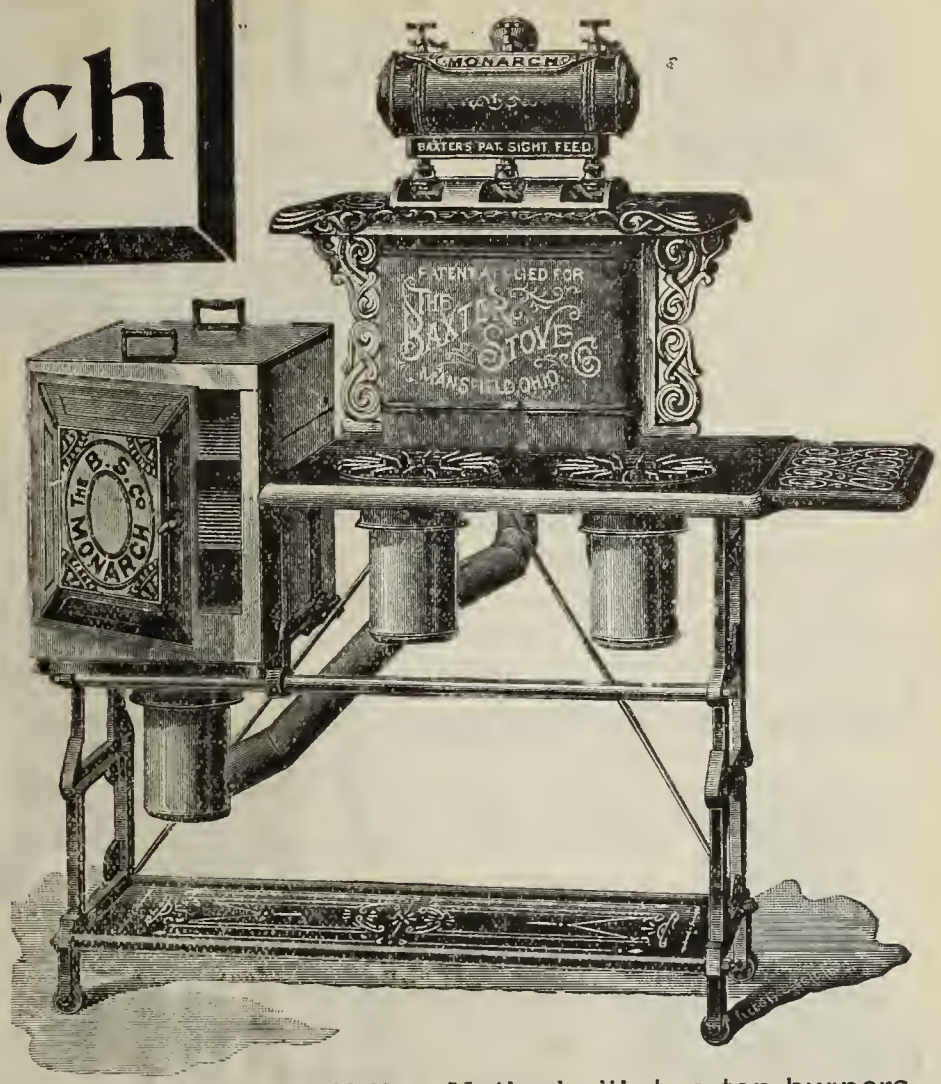
MANSFIELD, OHIO.

Agencies for New York, New Jersey, Pennsylvania and New England States,

THE DANVILLE STOVE & MFG. CO., Danville, Pa ,

AND 284 PEARL STREET, NEW YORK.

ARMSTRONG STOVE & MFG. CO., Baltimore, Md.
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J. J. PAQUETTE, No. 168 Camp Street, New Orleans, La.
THE ZAHNER & BATTELL MFG. CO., Kansas City, Mo.
THE HALL BROS. CO., Lincoln, Neb.
THE COOK RANGE & STOVE CO., No. 173 Lake Street, Chicago.
MR. G. W. CAHOON, No. 12 East 3d Street, St. Paul.
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No. 200 MONARCH New Method with two top burners and large oval oven burner.

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OFFICE AND WORKS: 15 and 17 Erie Street, - MILWAUKEE, WIS.

OUR LEADER FOR 1894.

Features.

Adjustable valves.
Superior in design.
Excellent in workmanship.
Cleaning burner attachment.
Great efficiency in doing work.
Extreme economy in gas consumption.

The drop door, unlike those on other ranges, is entirely new, simple and durable.

OUR CATALOGUE AND DISCOUNT SHEET ON REQUEST.



Our Goods are Superior in Quality of Material used and in Workmanship.

WILL MEET THE DEMAND.

We offer this line on its merits, coupled with the fact that its price is about one-quarter below any gas range heretofore offered by us.

We carry a full line of Heaters and Gas Grates.

Manufacturers of

Gas Stoves and Ranges,
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SALESROOMS ONLY, { SAN FRANCISCO, CAL., AND PORTLAND, OREGON.

BUY THE HELPER USE STEEL RANGES BEST ON EARTH 100 STYLES & SIZES PATENT OVENS

THEY SELL EASILY BECAUSE

They have points about which YOU CAN TALK

Points that never fail to PLEASE BUYERS.

THE GOOD POINTS

Of these Ranges are so good that the buyer at once admits their excellence.

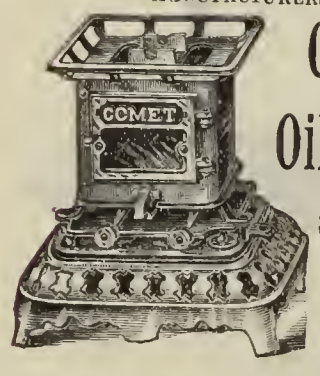
Drop us a postal card and we'll tell you what THESE GOOD POINTS ARE.

CHICAGO & ERIE STOVE CO.,

CHICAGO, ILL. ERIE, PA.

Luther & Lederhos,

MANUFACTURERS OF



Gas and Oil Stoves,

30 Cliff St., N. Y.

Write for Catalogue and Prices.

THE MAHONY BOILERS FOR STEAM AND HOT WATER HEATING

THE

"Front Rank Furnace"

NEEDS NO INVESTIGATION.

IT IS THE BEST.

Front Rank Steel Furnace Co.

St. Louis, Mo.

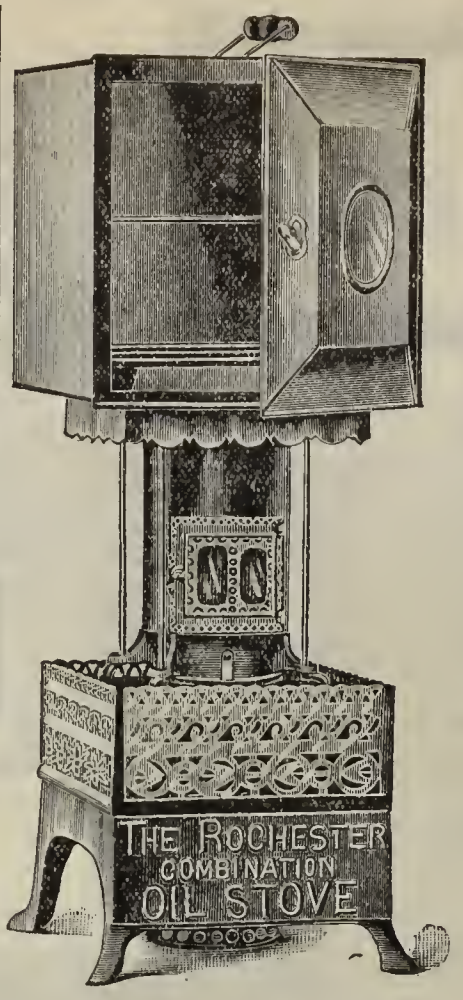


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W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons. Andirons, Tiles, &c.

Office and Showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.



The Rochester

(Central Draft)

OIL STOVES.

The Rochester Lamp has long been known as the finest lamp ever made. This is owing largely to its central draft and its perforated cone burner. We have adapted these valuable features to an oil stove. Thus our oil stove is as clean and the combustion as perfect and odorless as the finest drawing-room Rochester Lamp. **THE OIL TANK IS ALL BRASS,** the same as our Mammoth Fount (embossed) in popular Hanging Lamp **This is the only oil stove ever made** with a pure brass Oil Fount or Tank. The Brass Fount or Reservoir holds a full gallon and will burn ten hours, costing only one cent an hour. The Rochester No. 3 Oil Stove (shown in illustration) can be instantly changed from a Parlor Heater to a Cooker and to a Rochester Hanging or Bracket Lamp. The stove is **finished in nickel** and is the most ornamental and stylish stove ever put on the market. Price of Stove, complete (but without Heater or Oven), $6 50. Price of Heater (extra), $1.50. Oven (extra), $1.50.

DISCOUNT TO THE TRADE.

ROCHESTER LAMP CO.,

42 Park Place, New York.

BEAUTY OIL STOVES.

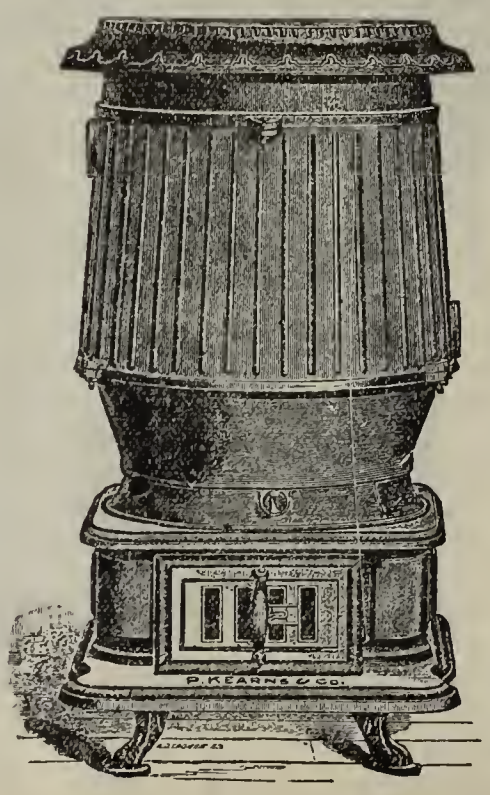
Twelve Styles and Sizes.

The only Flat Wick Central Draft Oil Stove made. Send for descriptive catalogue to

F. M. BORDEN & BRO., Philadelphia, Pa.
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C. T. CORBY, 117 Beekman St., New York.

OR TO THE MANUFACTURERS,

TROY OIL STOVE CO., TROY, N. Y.



IMPROVED

Hot Water Stoves

FOR HEATING

Baptisteries, Greenhouses, Forcing Beds, Circulating Boilers, Chicken Houses, Tanks for Laundries, Carving Tables, Plate Warmers, &c.

The most powerful and economical Water Heater in the market. Heats a large quantity of water quickly at very small expense, as the fuel is entirely surrounded by water. The top can be used for heating flat irons or doing small cooking.

Made in four Sizes, with Capacities of 100 to 400 Gallons, and Tapped for 1 inch to 3 inch Pipe.

SEND FOR PRICE-LIST.

KEARNS & RUDOLPH RANGE CO.,

1020 ARCH ST., PHILADELPHIA.

FACTORY: Burlington, N. J.

Gem-Climax



FOR COAL OR WOOD

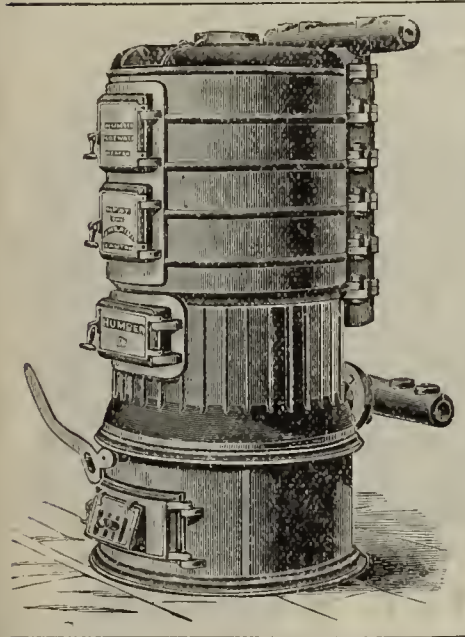
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made in all the various styles and sizes. The Flattering Success of the Gem-Climax medium priced, four hole range is in keeping with all the

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Climax Stoves and Ranges.

TAPLIN, RICE & CO., AKRON, OHIO.



HUMBER

HOT WATER HEATER.

20 SIZES. For HARD and SOFT COAL.

Perfect in Construction *Economical in Use.*

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Boston, - New York, - Chicago, - San Francisco.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET, - - - - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

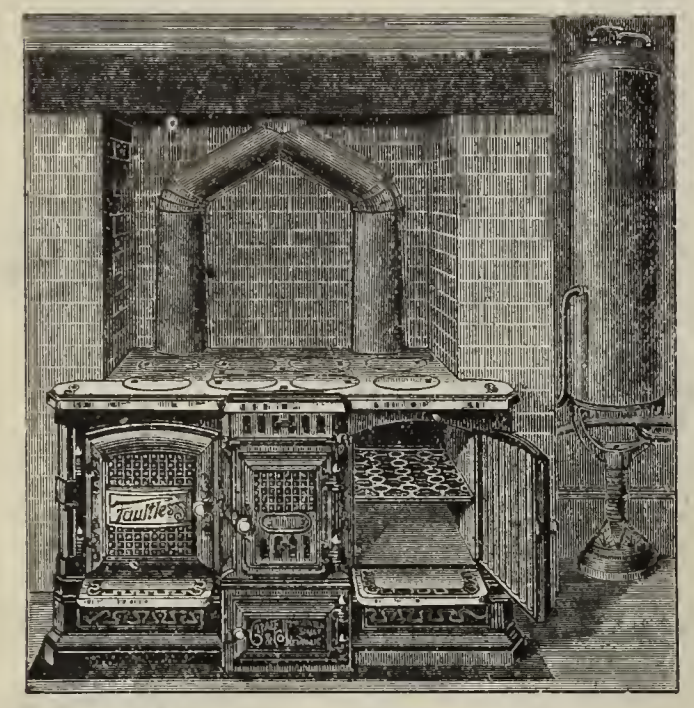
Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

WRITE TO THE · DIPPO · MANUFACTURING · COMPANY, CHAGRIN FALLS, OHIO,

FOR THEIR

NEW ILLUSTRATIVE AND DESCRIPTIVE CATALOGUE, * *TO BE ISSUED MAY 1st.* * **FERROSTEEL RANGES.**

"FAULTLESS."



DOUBLE OVEN RANGE.

BRICK-SET OR PORTABLE.

OVENS ARE WROUGHT IRON.

WHY WE DID IT.

The Reason why we Named our Ranges

"FAULTLESS"

is that they are

Absolutely Without a Fault.

TO THIS FACT

Thousands of people who are using them testify. You know what a good Range does for the peace of a home, therefore get a ***FAULTLESS*** one, and you can do no better.

We also make two sizes of the ***FAULTLESS*** in Single Oven Style, and they are warranted perfect in every respect.

GRAFF & COMPANY

208 Water St., - - New York.

A CONTINUAL PROCESSION OF



PARAGON. FIDELITY. PARAGON. FIDELITY. PARAGON.

PARACON FURNACES and FIDELITY RANGES

Is moving steadily from our works to the homes of delighted purchasers, by way of the stores of enterprising dealers, who have found profit in aiding the course of the procession. You can get into line if you will.

Isaac A. Sheppard & Co., Manufacturers, 1801 N. Fourth St., Philadelphia, Pa.

FOX FURNACES

THE

FOX FURNACE CO.,

Cleveland, O.

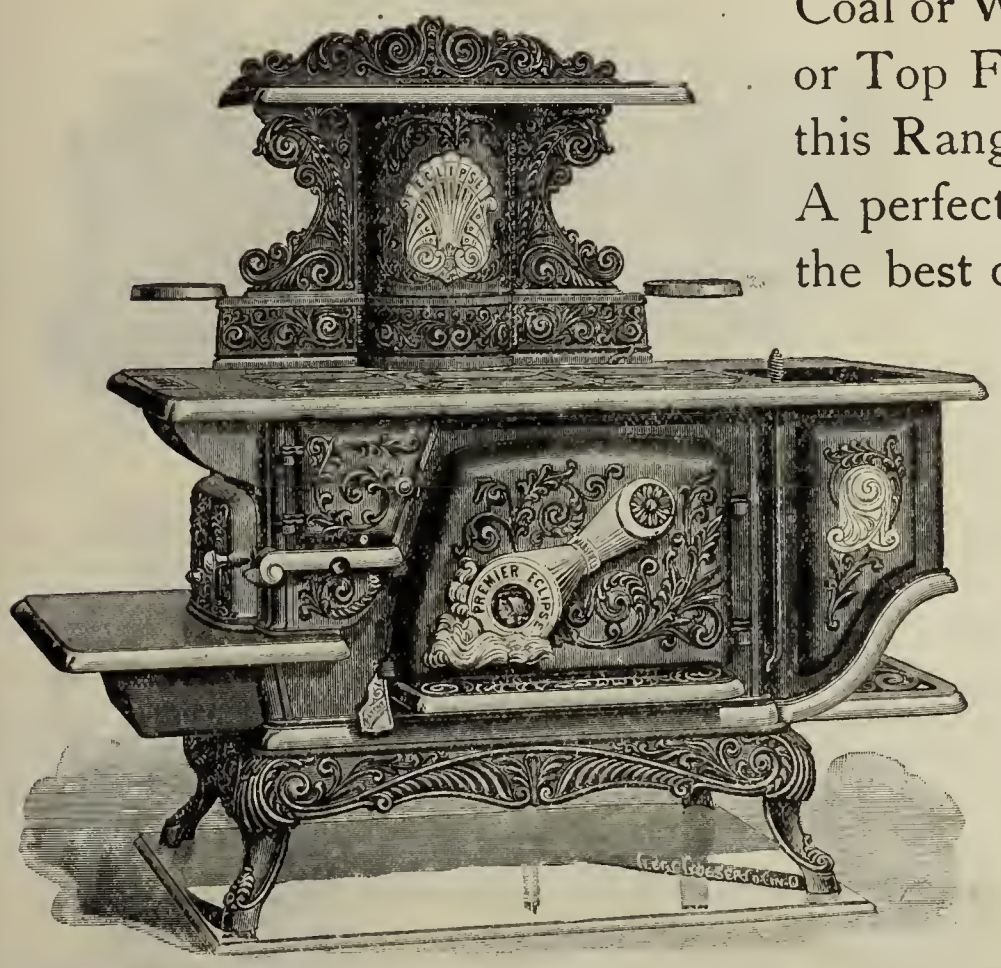
We want you to have a copy of our new Catalogue of

Fox Furnaces.

Drop us a Card TO-DAY.

The Premier Eclipse

With Encased Bracket Reservoir and High Shelf. Six Holes. Coal or Wood. Two sizes. Pouch or Top Feed. Everything about this Range is New and Modern. A perfect Baker and Roaster and the best construction of the present time. The Dealer sells it on sight and it never causes complaint. Write for Catalogue.



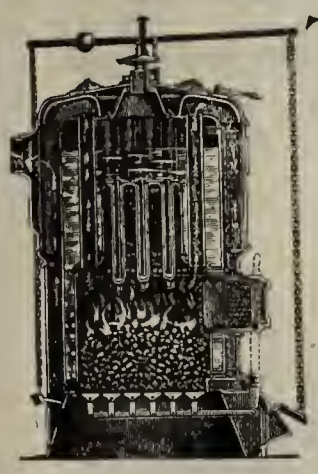
THE

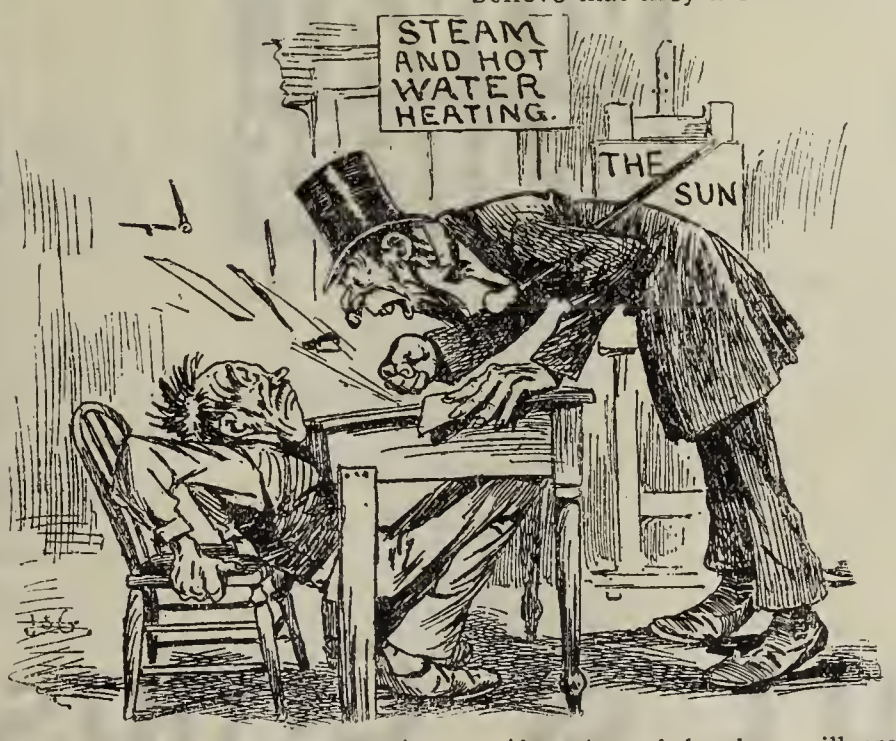
Eclipse Stove Co.,

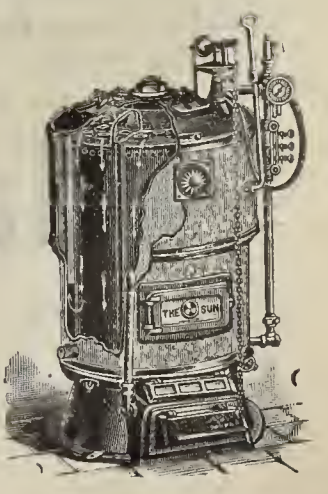
Mansfield, O.

The Lindemuth Steel Sun Steam AND Hot Water Boilers

Do not need a forced argument to make the trade believe that they are the best. ∴ ∴ ∴ ∴ ∴ ∴







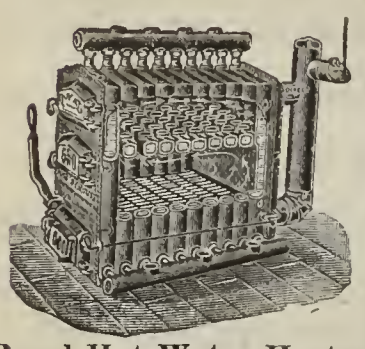
The Testimonials of their action and good results we can give you, if you but ask for them, will prove that the above is a fact. Write for prices and discounts.

MANUFACTURED BY **The Raymond & Campbell Mfg. Co.,**

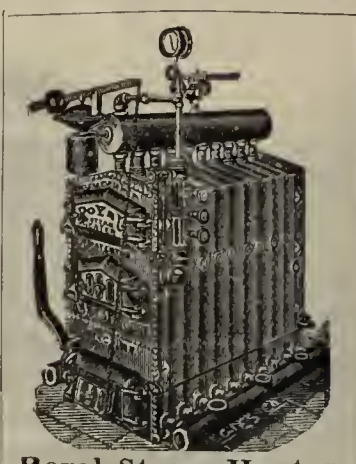
Main Office and Works, Middletown, Pa.
New York Store and Warehouse, No. 244 Water St.
Boston Agency, No. 4 Oliver Street.
Philadelphia Agency, No. 45 N. Seventh.
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Sold on their Merits,

and not on their Antiquity.



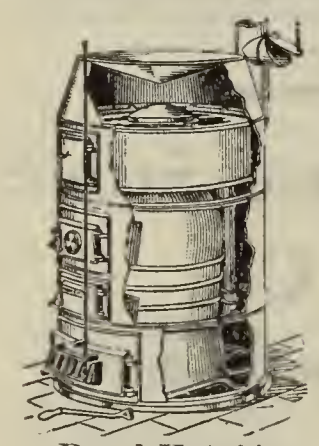
Royal Hot Water Heater.



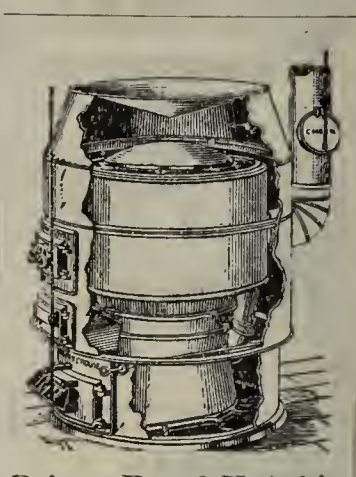
Royal Steam Heater.



Imperial Hot Air Furnace.

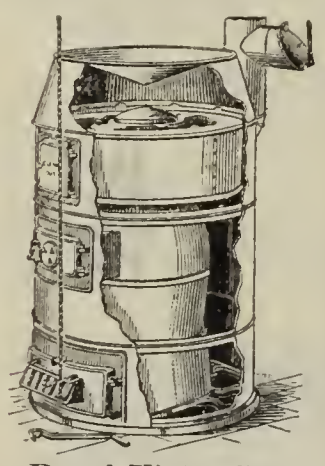


Royal Hot Air Furnace.

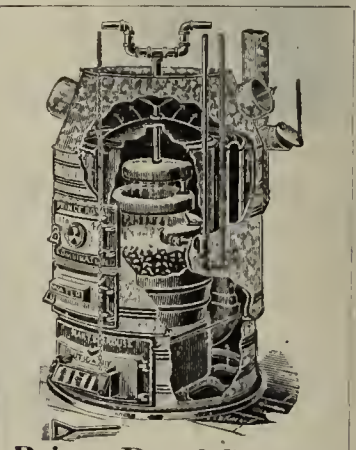


Prince Royal Hot Air Furnace.

ROYAL HEATERS



Royal Victor Hot Air Furnace.



Prince Royal Combination Heater.

Hart & Crouse,

No. 1 Cornelia Street, UTICA, N. Y.

CHICAGO, 113 LAKE STREET.

W. M. MACKAY, Manager Hot Water and Steam Dept., No. 211 Water St., New York.



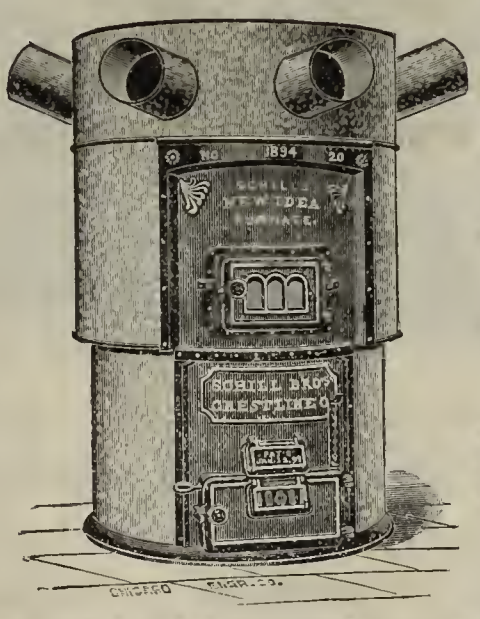
This range was advertised last year with triangular grate. Now it has triangular, duplex, or flat. All that is needed to change from one style to either of the others is a new number-plate. No changing of bricks or grate frame, nor even taking them out.

Let us send you a full description.

THE STAMFORD FOUNDRY COMPANY,
STAMFORD, CONN.

The
New
Idea

The only Sanitary burning Hard and Soft Coal, Coke, Wood and Gas made.



Warm Houses, Cool Cellars, Pure Air, Large Volumes, Cheap Fuel, Small Quantities, are only a few of its Good Qualities.

Territory Open.
Write for Agency.

SCHILL BROS., Crestline, O.

DAVIS, JOHNSON & CO., Chicago.
UNION IRON WKS. MFG. CO., Denver, Col.

MICA

ALL KINDS AND SIZES.
WRITE FOR PRICES TO
PALERMO MICA CO.,
MINERS, IMPORTERS AND WHOLESALE DEALERS,
27 PECK SLIP, NEW YORK.
S. T. PECKHAM, Sales Manager.

Chicago Branch :
67 & 69 Lake Street.



The New Metal.

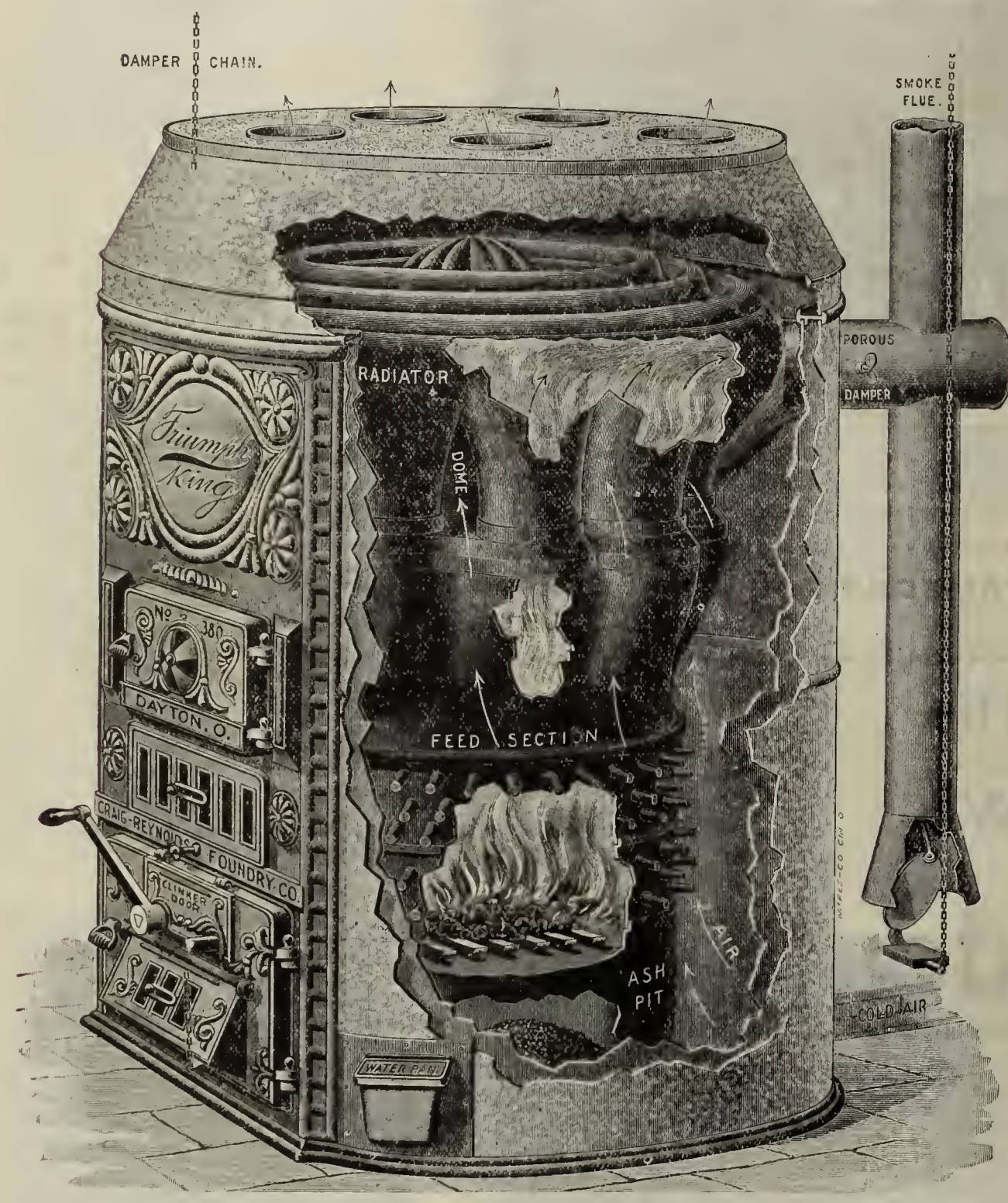
The newcomer, silvinite, is an alloy composed chiefly of aluminum, and although, says an exchaage, it has been introduced with a flourish of trumpets, its practical status has not yet been determined. It has great lightness, silvery luster, malleability and ductility, and although comparatively soft, is tough and strong. In decorative work it may be used either in its natural color, which is not easily tarnished, or painted with oil colors, which it "takes" well. The manufacturers also claim that it enamels well, but if so the enamel material applied must be fusible at an exceptionally low temperature, as the metal itself softens and fuses very readily. The suggestion that it would be a good substitute for corrugated iron for roofing is ill advised. In the event of a fire a silvinite roof would collapse very quickly, and thus cause a more complete wreck than would result if iron were in use. Sulphuretted hydrogen does not tarnish the metal, even after prolonged exposure; ammonia, on the other hand, distinctly affects its surface, while caustic alkalis and dilute mineral acids rapidly dissolve it. Vegetable acids, such as acetic, do not seem to produce any impression on the metal, but whether prolonged action, aided by alternate wetting and drying by exposure to air, will cause corrosion time alone can prove. There is undoubtedly a large field open for this valuable metal, but that it will really supersede any of the other metals in common use is not likely.

—THE POWER OF CONSCIENCE.—The proverb, "A guilty conscience needs no accuser," has been discounted in one Maine village by the effects of a general accusation published in the local paper. A tradesman had missed articles from his stock from time to time, and at length the clerk saw a woman take things she did not buy and pay for. This furnished the desired opportunity. An advertisement in the paper over the merchant's signature said he had positive proof that "some of the best ladies" of the town had taken articles from his store, and if matters were not fixed up there would be a rumpus. This was only last week, and so far four women have been in to "settle up," with possibly more to follow. One woman came from an adjoining town to admit that she took up an article one day with the thought of stealing it, but repented and put it back again. In these cases the guilty conscience alone was not enough to do the business; the accuser was needed as well.—*Boston Journal.*

—MERE FORCE OF HABIT.—Judge Cowing: "You are charged with having knocked your wife down with a club and then kicked her. Do you know of any mitigating circumstance?"

"Well, yes, your honor. You see, that's the way I always do when anybody annoys me."—*Texas Siftings.*

Triumph Furnaces



Modern in Construction and Design.

Perfect in Operation.

The Essence of Economy, Durability and Merit Combined in one Apparatus.

SAY *what you will, there is no argument nor requirement that can be brought up regarding Warm Air Furnaces that is not met in the fullest sense by "The Triumph" series. They are so good, so practical, so reliable and economical that in short nothing but words of the highest commendation can be and is constantly said of them. If seeking your best interests, it would be well to investigate our productions.*

The Craig=Reynolds Foundry Co., Dayton, O.

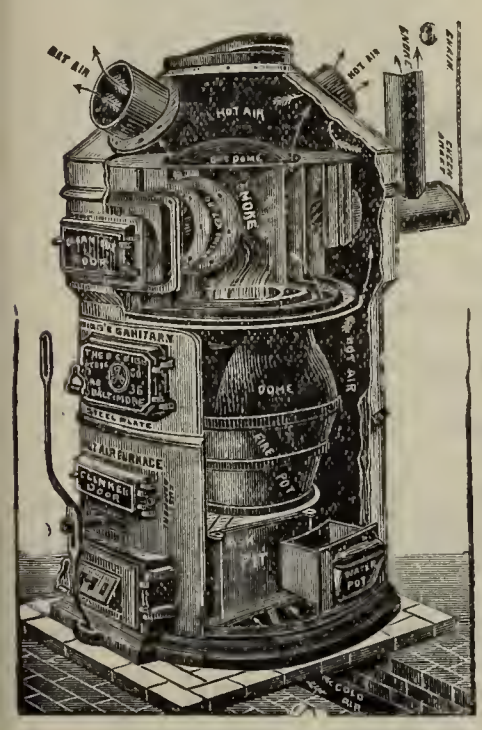


KEEP IN MIND

The Plummer
Steam Heater
AND
The Leader
Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,
PUTNAM, CONN.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY HOT AIR FURNACE.

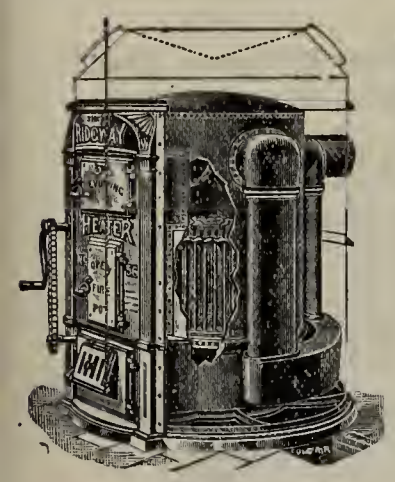
Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

Baltimore Fire Place Heaters,

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW-WARE, &c.
Send for Catalogue with Testimonials.

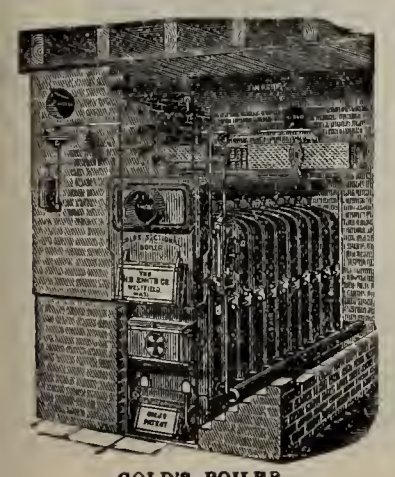


RIDGWAY REVOLVING HEATER.

OPEN FIRE POT.
The Best Furnace Made.
HIGHEST AWARD AT WORLD'S FAIR.

SEND FOR CIRCULAR.

RIDGWAY FURNACE CO.,
BOSTON, MASS.



GOLD'S BOILER

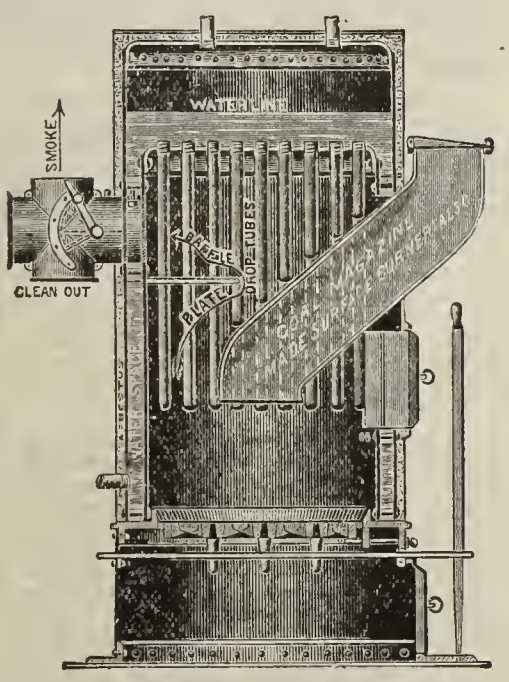
THE H. B. SMITH CO.,
MANUFACTURERS OF
Steam and Water
Heating Apparatus
FOR
PUBLIC BUILDINGS AND PRIVATE RESIDENCES
SPECIALTIES:

Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
Reed's Improved Cast-Iron Radiators,
Gold's Indirect Pin Radiators,
Breckenridge's Patent Automatic Air Valves.
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for hard or soft coal.

Office & Warerooms, 137 Centre Street, New York
FOUNDRY, WESTFIELD, MASS.
Catalogues Sent on Application.



BROOMELL, SCHMIDT & CO., Ltd.,
MANUFACTURERS OF
Steam and Water Heating Apparatus.
THE KEYSTONE BOILER.



KEYSTONE

The Heatencook Range, Radiators, Horizontal Boilers, Smoke Stacks, Tanks, Steam Pumps, American Fuel Economizers, &c.

SEND FOR PRICES.

Main Office and Works, YORK, PA.
Philadelphia Store and Office, 146 North 3d St.

NOTE.—The Heatencook Range (House Heating from the kitchen fire) can be seen in operation at our Philadelphia store.



— His Revenge. — Mother: "Dr. Wines has been complaining of your conduct on his front stoop."

Son: "It was all his own fault! He gave me an awful lickin' in school."

Mother: "Well, that shouldn't have made you revengeful."

Son: "I only added to his door plate Wines—'and other Lickers.'"—*New York Ledger.*

THE METAL WORKER ESSAYS

—ON—

HOUSE HEATING

—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

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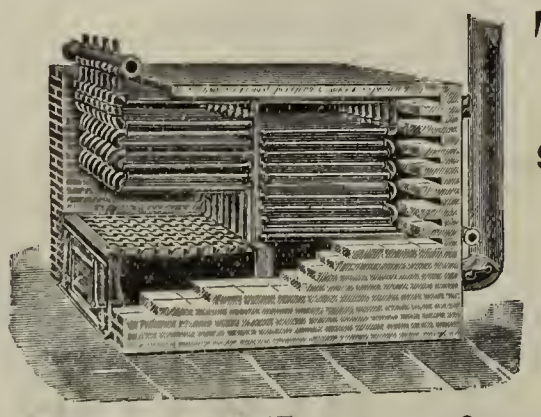
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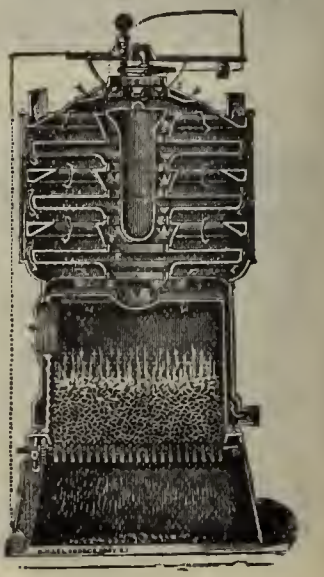
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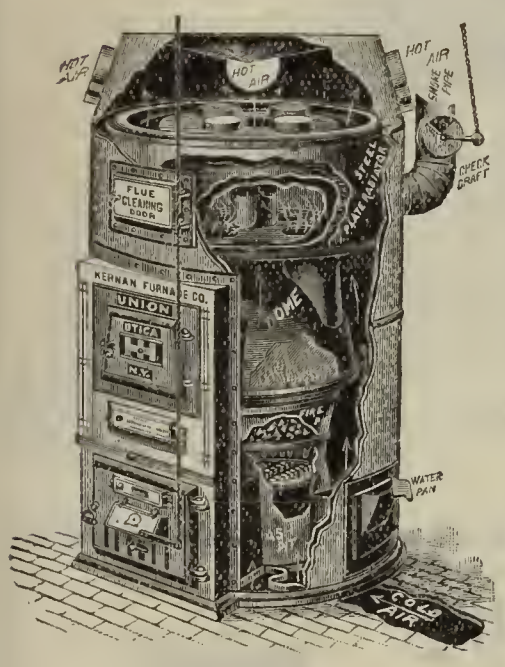
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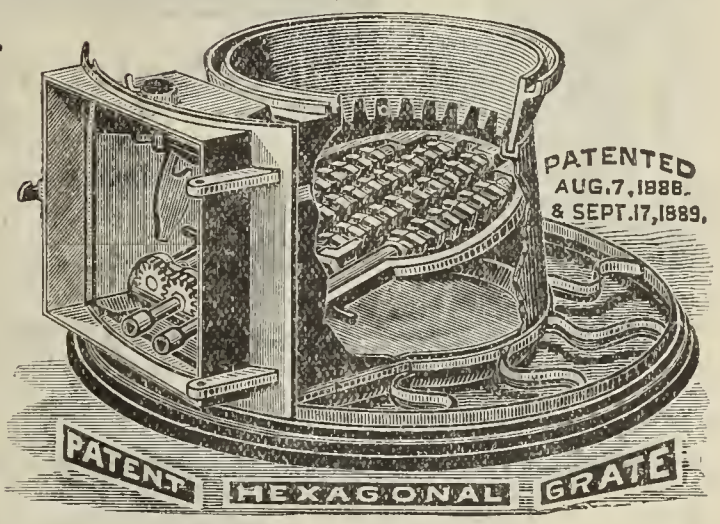
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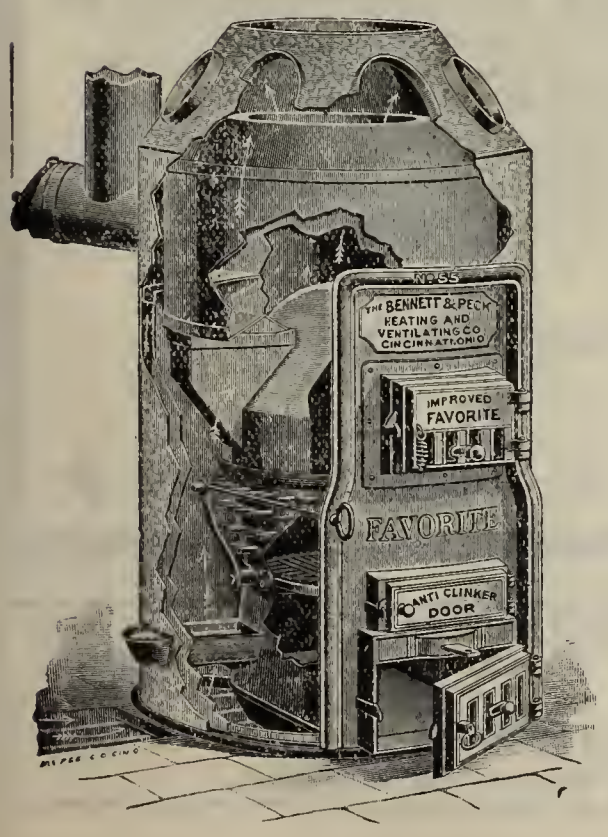
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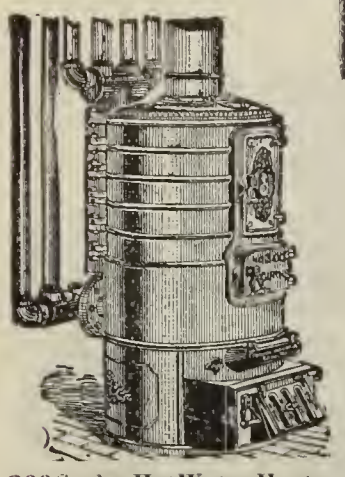
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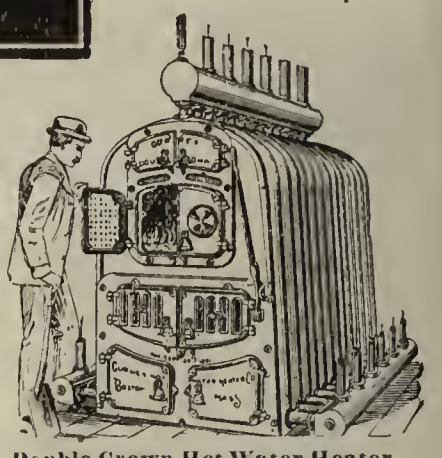
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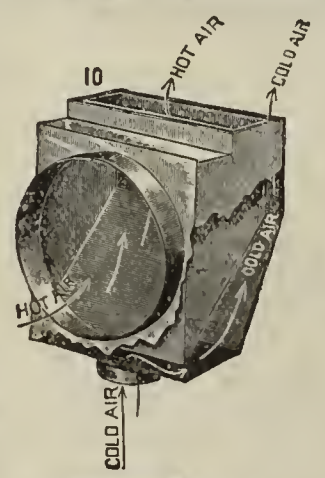
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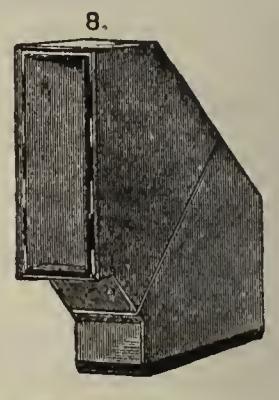
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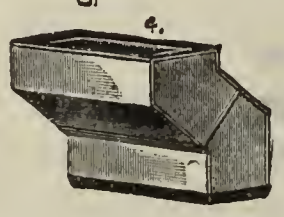
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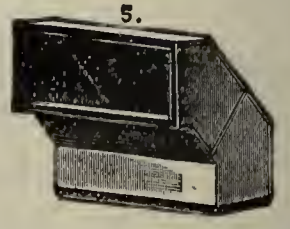
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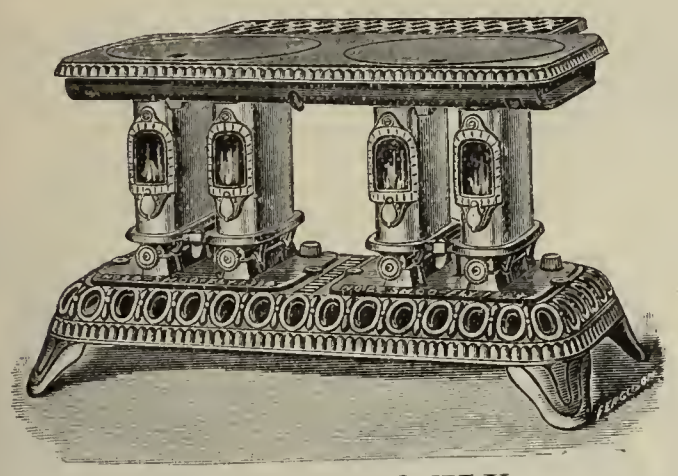
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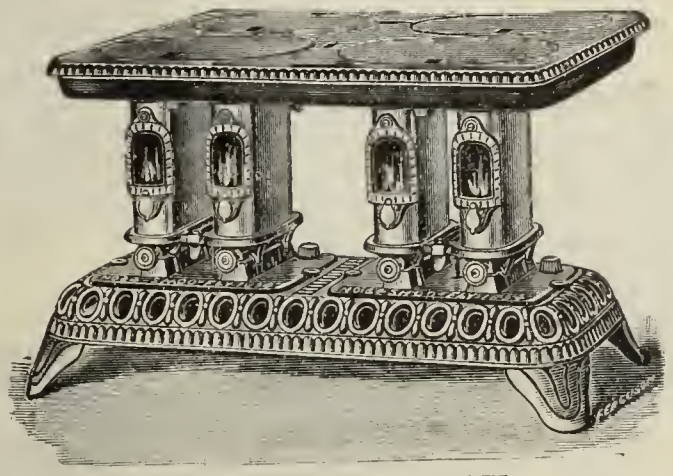


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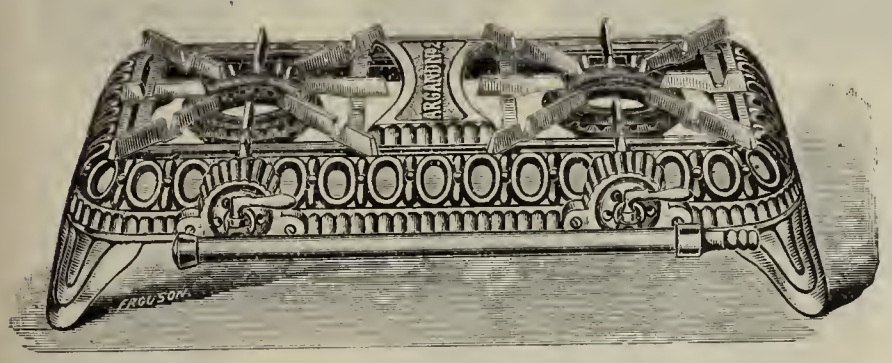
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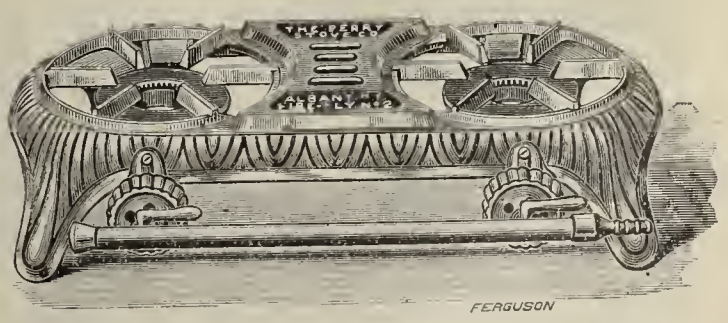
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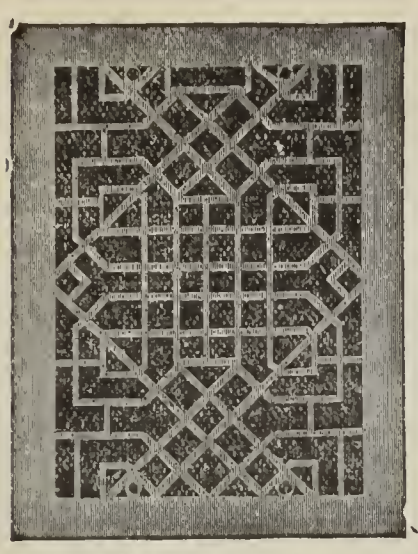
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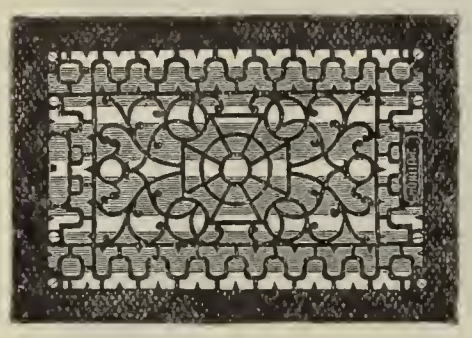
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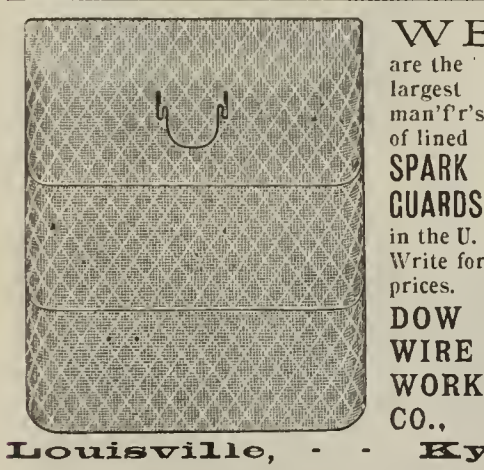
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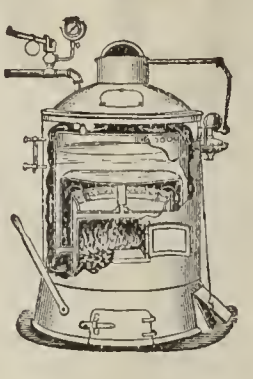
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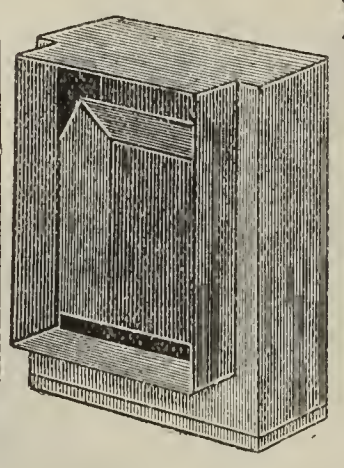
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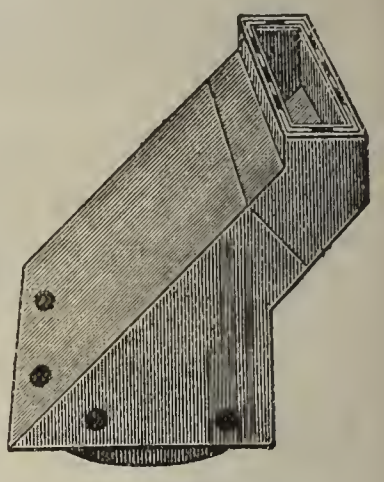


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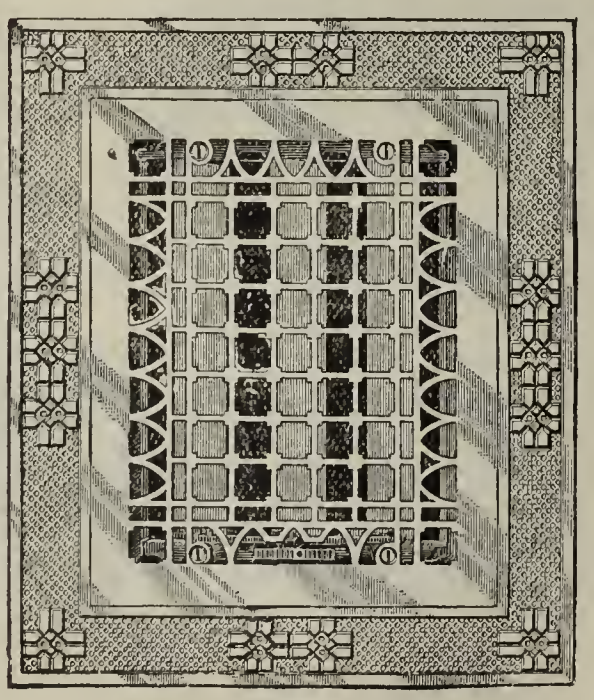


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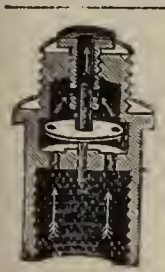


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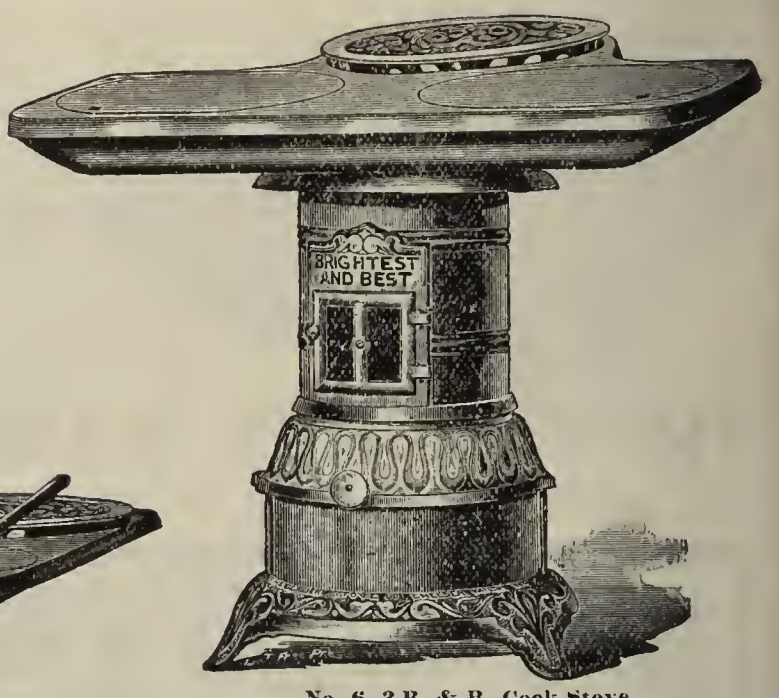
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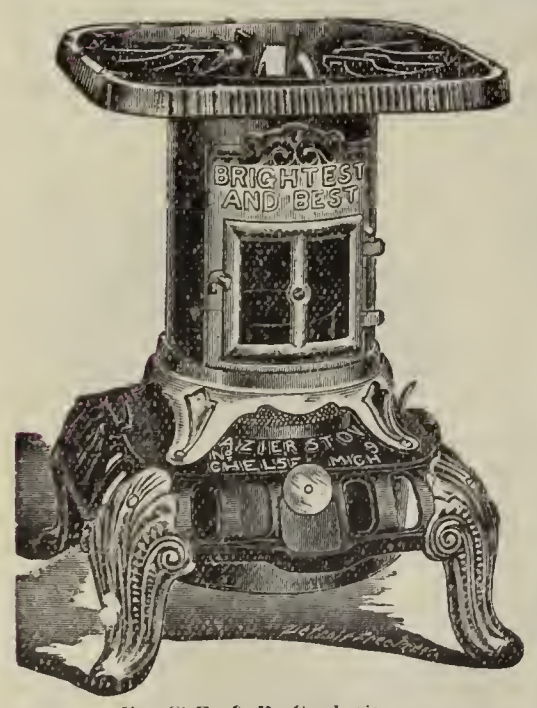
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THE METAL WORKER.

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Modern Plumbing.

To the interested observer a growing change in plumbing work can be seen. The skillfully executed and beautiful lead work that has been the pride of the plumber since the craft first came into existence fails to hold the people loyal to it. As the handsome white porcelain lavatory and the earthware water closets have supplanted the appliances of a few years back, so have the nickel plated traps and pipes grown in favor. The use of wrought iron for both drainage and service pipes has made rapid advance recently. A plumber of the old school who has never left the vanguard recently said that in his highest class work he frequently used less than 100 pounds of lead on jobs where formerly tons would have been used. Another plumber who seeks only contracts where the very best work will be demanded stated that what he considered the finest job of plumbing in the United States did not have a pound of lead used on it. And so the practice of the trade is changing, and the plumber, who as his name implies was originally a worker in lead, is becoming more and more a worker in iron and other metals. Or to speak more accurately, he is not so much a worker in metals as a worker in metallic goods; a domestic engineer whose business it is to lay out a system of plumbing and install the apparatus with their proper connections.

The Franklin Trade School.

It is announced that the trustees of the Franklin Fund in the city of Boston have definitely decided that the sum available—now amounting to about $300,000—shall be devoted to the establishment of a trade school, after the pattern of that in New York. A committee of the trustees, accompanied by the City Architect, are about to visit the schools of this nature now in operation in New York, Brooklyn, Philadelphia and other places, in order to obtain the necessary practical information as to buildings, equipment and methods. Their intention, it is said, is to have the plans drawn and the work of building begun at the earliest practicable moment. When erected and equipped the institution must, according to the terms of Franklin's will, be transferred to the city, which will be responsible for its permanent maintenance.

The Tin Plate Situation.

One of the marked features of the present tin plate situation, induced by tariff uncertainty, is the large and increasing proportion of tin plates held in bond at New York, as shown by the returns for March 31, 1894. The value of such material in bond at that date was nearly double that of tin plate in bond at the end of February. The quantity thus held at the end of March was 4300 tons, compared with 2376 tons on the same date in 1893, although the importation for the first three months of this year was much below that of the corresponding period in 1893. The reason is not far to seek. Importers are not inclined to pay the existing duty on any large amount of stock, which may be left on their hands at a considerably reduced value in the event of a reduction in the tariff. Consequently they are content to withdraw from bond only such goods as they can readily dispose of at present prices. Meanwhile shipments from the other side are not increasing in any material degree, and free stocks in dealers' hands have been shrinking week by week and are now of unprecedentedly small proportions. Should a sudden expansion in the demand develop for any reason, such as an unforeseen access of energy on the part of the Washington lawmakers, resulting in the summary passage of the new tariff law, importers and jobbers of tin plates would be in a very poor position to meet the same. The English exports of tin plates to the United States in tons for the first three months in each of the past five years were as follows: 1894, 48,616; 1893, 75,022; 1892. 62,611; 1891, 98,909; 1890, 59,197.

A novel and effective method adapted by the Philadelphia branch of the Women's National Health Protective Association for abating nuisances is photography. In a certain quarter of the Quaker City the refuse from a stable and from an adjoining cigar factory had long been piled together in a heap that was a nuisance and a menace to the health of all who resided in the neighborhood. A member of the association had the objectionable mass photographed, and sent a blue print of it, with her complaint, to the Board of Health. The nuisance was promptly abated.

An Open Letter on Profit Sharing.

The Association for the Promotion of Profit Sharing has issued the following letter. It is signed by Carroll D. Wright, Washington, president; Francis A. Walker, Boston, N. O Nelson, St. Louis, vice-presidents; N. P. Gilman, Boston, secretary; R Fulton Cutting, New York, Alfred Dolge, New York, R. R. Bowker, New York, Henry R. Towne, Stamford, Conn., George A. Chace, Fall River, Mass., directors:

In anticipation of a revival of business and the consequent reopening of many mills and factories, which now seems probable, we would invite your attention to the importance of introducing some form of profit sharing as a feature of your industrial relationships. The method of paying a dividend to the workman out of profits as they are realized annually has been approved by most of the economists of Europe and America as thoroughly practical, and advantageous to both the employer and the employed. We will mention a few characteristics which should commend it to your careful attention.

Profit sharing can be adopted by an employer without risk of loss, inasmuch as he assumes under it no obligations except such as are to be discharged from profits actually made. His prerogatives as manager and his rights as proprietor are not curtailed. Profit sharing would establish a more friendly relationship of common interest between working people and the employer. This would be the surest pledge of industrial peace and the firmest support in times of commercial distress.

The employee, responding to such an advance by the employer, can increase the quantity and improve the quality of the product under a deeper feeling of personal interest. By his diligence, care and economy, he can actually create an additional profit, which is to be used in supplementing regular wages. Profit sharing includes the payment of the best wages current, and promises a bonus beyond this, which, experience shows, the interested workman can invariably produce in good times.

Profit sharing as a principle may be applied in a large variety of ways, and it can be readily adapted to the great majority of productive and distributive enterprises. We invite applications for full information concerning the history and the results of the system as it is now in operation in many establishments, small and large, in Europe and the United States. The address of the secretary of our association is 25 Beacon street, Boston, Mass.

According to the reports gathered by the *Journal of Commerce*, the fire losses of the United States and Canada for the month of March show a gratifying decrease. They were in all $9,147,100, or over $2,000,000 less than those of February, and considerably below those of the corresponding month of 1892 and 1893.

THE LETTER BOX.

Some Electrical Questions.

From C. W. S., *Brooklyn, N. Y.*—Referring to those talks on electricity that appeared lately in *The Metal Worker*, there are some further points concerning which I seek for information and trust that you will be able to supply my wants.

1. Is there any difference between an induction and spark coil?
2. What kind of work are storage batteries most suited to?
3. Why are zincs in batteries amalgamated?
4. How can you tell when the battery needs recharging?
5. Does the carbon part of battery ever need renewing?
6. Is the battery wire on ordinary work heavier than the return wire? Also what sizes of wires are used for different kinds of work?
7. Is there a rule to tell the number of batteries required on different kinds of work?

Answer.—We have submitted the above questions to the author of the serial article on "Domestic Electrical Work," and he furnishes us the following answers:

1. Yes, the induction coil consists of a primary coil of coarse wire, surrounded by a secondary coil of very fine wire, and provided with an interrupter to break the primary circuit in rapid succession. The passage of a current through the primary coil induces currents having very high electromotive force in the secondary coil and will throw a spark across considerable space. This coil is used, for instance, to ignite blasting cartridges or for multiple gas lighting. The spark coil simply consists of what constitutes the primary part of an induction coil and is used for ordinary electric gas lighting.

2. Storage batteries are used for electric lighting and running motors. They are not capable of generating electrical energy, but are used simply to receive a current from some primary source and store it for use at a future time.

3. The amalgamation of zincs simply means coating their surface with mercury to protect the naked surface from what is known as local action. This wasteful action is the result of hard or soft spots in the zinc, and the waste is caused by little local currents being set up between them. By amalgamating the surface with mercury all these spots are connected together, thus preventing the formation of local currents.

4. The first intimation that a battery needed attention would be the weakening of the current or a milky appearance of the solution. If the latter, put in a new solution; if only a weakening of the current, examine the zinc, and if badly corroded renew it, or if in fairly good condition, it may only need a good scraping. If this does not improve the battery, renew the solution and zinc.

5. It does not.

6. In cases where but one battery and one return wire are used both may be of the same size, but in cases like hotel annunciator work where the battery wire may be called upon to furnish current to ring a number of bells at the same time, it is obvious that this wire should be larger than the return wires. It is customary to use No. 16 for battery and No. 18 for return wires in this class of work. In ordinary bell and gas lighting work No. 18 is used for both.

7. As a general rule the best results are obtained by connecting the battery in such a manner that the external and internal resistance are equal. In some cases, however, this will not be possible, and a combination must be chosen which will come nearest to these conditions. As, for instance, connecting the cells in series, multiple arc, or multiple series. Where the external resistance is great the battery should be connected in series in order to secure a great electromotive force; when the external resistance is small, connect the battery in multiple arc. If the total internal resistance of a battery connected in series is greater than the external resistance, the following combination should be adopted: Multiply the number of cells by the external resistance, divide this by the resistance of a single cell and take the square root of this quotient; this will give the number of cells to be connected in series.

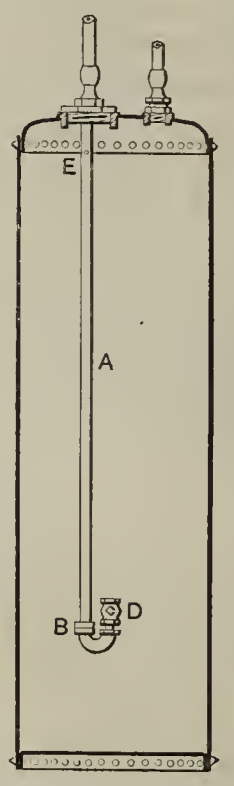
Wants a Rust Preventive.

From A. L. H., *Woburn, Mass.*—I would like a receipt for making some kind of a blacking to keep parlor stoves from rusting when they are stored for the summer. Can *The Metal Worker*, or some of its readers, supply it?

Answer.—Protection for cast iron stoves has been generally considered unnecessary, but for sheet iron stoves satisfaction has attended the use of a coating made of common beeswax dissolved in deodorized benzine. Just enough of the wax should be used to make a very light film on the iron to protect it from the condensation of the moisture in the air and not enough to interfere with blacking the stoves in the fall. It should be applied with a soft varnish brush. It must be kept in a tight vessel to prevent evaporation.

Safety Device for Boilers.

From H. W. W., *New York.*—I send a sketch which shows my idea for the prevention of accidents to kitchen boilers. The cold water pipe A has a short return bend on the lower end connected by a socket at B. The opening at the top of the boiler for the cold water pipe should be much larger than usual, to allow the bend to be inserted, and should be stopped by a reducing plug. On the return bend at D a check valve is placed and a hole is made in the supply pipe at E. This arrangement practically does away with



Safety Device for Boilers.

the expansion pipe which carries off so much heat and will also prevent explosions. When the pressure rises it will back through the hole at E into the main. The check valve will prevent the water being syphoned out of the boiler and steam can escape through the hole at E. I shall be glad to hear what the readers think of my arrangement.

Liability for Loans to Salesmen.

From E. M. W., *New York.*—Please publish your opinion as to the liability of a concern for money advanced to its representative. For illustration, an *attaché* of Sheet, Iron & Co. tells me he missed his remittance and asked the loan of funds until he shall receive the same. Do you consider Sheet, Iron & Co. liable for this?

Answer.—Our opinion is that "Sheet, Iron & Co." are not liable for the amount of the loan advanced to their representative. The power of borrowing money on the credit of an employer

for the personal benefit of an employee does not generally exist. And the fact that the money is borrowed for traveling or necessary expenses connected with the business of the employer makes no difference. It would be unwise and unsafe business policy to give a traveling representative a general power to bind his employer in this way. He might have received his remittance and lost it or gambled it away, and it would be a great hardship to compel his employer to pay the amount over again. The opportunities for fraud and collusion are infinite. If any such general liability obtained it would be easy to mulct the employer for a considerable sum. A salesman who feared he was about to be discharged could realize a very handsome amount by resorting to this method of involving his concern. A dishonest representative of a large house could in a single city apply to dozens of business men with whom his firm had dealings and obtain loans on the plea of "missing his remittance," and if the law sanctioned such a transaction his employers would be heavy losers in case the scheme was systematically worked. And it would not be difficult to do it. If the men applied to felt and knew that the law would compel the employer to make good the loan they would not hesitate if the house represented was a reputable and solvent concern. This is self evident. But it is a well-known fact that such advances are not made freely by business men to traveling salesmen. They are only made where there is a long acquaintance with the representative or where there is a feeling of personal trust in the salesman himself. Of course these loans are very frequent and common, but when they are made they are based upon the considerations mentioned. A business man would hesitate where such an application was made by a new and unknown salesman or one in whom he had lost confidence. Of course the lender has this security. He feels that his custom is valuable perhaps to the house represented by the borrower, and a threat of placing that custom elsewhere might and in many cases very likely would result in forcing the employer to sacrifice the amount of the advance rather than to lose his trade. But these are considerations of business policy and not of strict right. The law is clear, in our opinion. The loan is made to the salesman and he only is liable. His employers cannot be held. This is not merely an opinion. It has been so decided by the courts of New York in actual litigation, and we do not doubt that the same legal reasoning would be followed everywhere. There may be an exception in cases where the employer has permitted such loans to be made and has ratified them and made them good. This might create a custom with a particular concern on which they might have the right to rely. But these cases would be rare and the liability more or less doubtful even then. Of course, an express authority to the salesman to borrow money for his expenses would without question bind his firm. It would, however, be hard to prove, if the authority was denied on the actual trial of a case. We have considered the case of a traveling salesman, to which we presume our correspondent refers. He uses the words "representative" and "*attaché*." We can easily conceive that if the "representative" or "*attaché*" were the president or treasurer or other officer or the manager of the company or a member of a firm, the rule would be different. Such responsible officers and agents would in most cases have a right to make their principal liable for such loans contracted for the benefit of the principal and necessary for the transaction of the principal's business. But even then the principal would not usually be liable for loans made for the personal benefit of the borrower. It might raise a nice question, and if the amount was large the lender would inherit a lawsuit, the issue of which would be by no means certain.

Chimney Flues and Their Drafts.

From CRITIC, *New York.*—It is an axiom that two things exactly alike will act identically the same when the conditions are the same. This is true of the flues of a residence as of anything else, although many builders will dispute it. If built alike and situated and used in the same way, the results will be equally good in each one.

There are, however, many slight changes or oversights that may, unknown or unnoticed by the builder, serve as a complete ruination of the draft of a flue. For example, we have six houses, each with a single chimney and a single flue, the latter, however, with four openings—two on each floor. In four of the houses the draft is good and no trouble from soot is experienced, while in two soot has accumulated rapidly. In the first four direct draft stoves are used in each four rooms having openings to the flues. In the unfortunate two only two stoves with return drafts are used. The brick work is the same in all, so, evidently, the heating apparatus or its arrangement is at fault.

First examine the apparatus. Any check in the passage of the smoke and gas from any heating apparatus means a loss of heat to the smoke, and (here is the valuable point) is, of course, retained in the room or building. The loss of heat to the smoke and gas means an increase in weight. It is not so light as when hot, and there is less tendency for it to rise. This makes the draft sluggish, and the small particles of carbon and ash that give smoke its color are carried with greater difficulty and are to a much greater extent left in the flue as soot. This is one reason. Next, examine the arrangement of the openings to the flue. There are four in all the chimneys. And here it will not be amiss to say that never should there be a flue with more than one fire place, and it is best never to have more than one opening of any kind below the roof. In the "good" flues each opening is filled with an inflow of warm air and smoke, and each helps the draft of the others. In the "poor" flues two openings admit fairly warm smoke, while the others leak in cold or cool air, the latter not only not helping the draft but seriously injuring the movement by chilling the air that otherwise would rise because it was warm. Thus, where at first glance the conditions are the same and results dissimilar, we find on examination that the things themselves are quite different.

Leaving the example taken, it may be suggested that a flue on the inside of a residence will burn better than one in an outer wall, and, quite as important, will give a far larger amount of heat to the building. If a flue is placed on the outside it should have 8 inches of brick work on the exposed side, all the way to the cornice. The interior walls of a flue should not be over 4 inches, as here the escape of heat from the smoke means the gain of warmth in the house. Tight brick work is absolutely necessary for a good draft, and it is better, if the surface is plastered, to coat the outside rather than the inside. A flue circular in cross section is the best, and the shape nearest approaching this is most desirable. A square is, therefore, the best shape for ordinary brick work, being 8 x 8 inches for the usual fire place or range. Triangular flues are the worst a builder can conveniently make. They have over four-fifths the wall area, which means proportional loss of heat and proportional loss of speed, while their cross area is only half. Besides, the sharp angles offer additional friction, and so the resistance is even more than that of the square flue, while the volume is only half.

The man who builds a straight flue of good brick work above the top of the house and who has but a single opening to each flue need have no fear as to the results, provided his neighbors do not interfere.

Can Top Wanted.

From J. G. BLAKELY & Co., *Grand Rapids, Mich.*—Can any of your readers inform us who manufactures a can screw top, in which when the top is pressed down with the thumb the oil flows into the lamp and when the thumb is released the oil ceases to flow? These tops are on the market and are manufactured by some one in the United States, we think.

Hanging Gutters.

The following entertaining letter comes from a Montana correspondent who was asked to give his method of hanging long gutters:

If there is anything that I know less about than another it is gutter hanging. Have done a few jobs, however, and always had good luck. Never had a job blow down. Always used the old tin strips. The proposition you suggest of a barn 80 feet long would depend some on circumstances, lay of ground for drainage and how many down spouts we could work on the "old man." There are very few buildings in this country with gutters outside the towns; that is, the business houses with flat roofs, and they would be better without them as they fill up with ice and back up the water 6 inches deep at times.

The Indiana Board of Health has ordered the vaccination of all tramps found in the State.

The Vermont Slate Industry.

In a recent issue the Troy *Times* gave a very interesting description of the typical Vermont village of Fair Haven, illustrated by excellent engravings. From this article we extract the following account of the important slate quarrying industry for which that locality is famous:

The principal industry of Fair Haven is the quarrying and working of slate, the town being the slate center of Vermont, the State ranking second to Pennsylvania in the quantity of slate produced and second to none in the quality. In the hills about the town are some of the choicest veins of slate in the world, and it is estimated that no community has a larger number of quarries within its borders. Everywhere is seen the impress of quarrying. Derricks and lofty lifting cranes are almost everywhere noticed. Nearly all colors of slate are quarried, the principal being green, reddish brown, chocolate, "slate," mottled, bright red and bluish gray. The product is worked into every conceivable article for which slate may be used. Roofing and tiling slate are most produced, but slate for marbleizing and conversion into mantels, billiard beds, slabs, tanks and a score of other uses is also quarried.

The quarrying of slate in Western Vermont was commenced in 1839 by Alanson Allen and Caleb B. Ranney. The first quarries were for securing school slates, but the product did not meet the requirements for this use, being too hard, and in 1847 the first slate for roofing purposes was quarried. This is said to have been used on a house at Whitehall. The business continued to develop, until now it is a leading industry of Vermont and New England. Among the pioneers in the marbleizing of slate were Ryland Hanger and James Coulman, the latter being a member of the present firm of Coulman & Wescott. Mr. Coulman first began marbleizing slate in 1859 and has almost continuously been engaged in the business until the present time. Coulman & Wescott do a large business, the firm being formed in 1881. The firm employ about 50 men when operating in full, the wares including nearly every article into which slate is converted. Both members of the firm are practical slate workers. The firm own a quarry which produces a superior quality of green slate. Mr. Coulman is, perhaps, the oldest manufacturer still actively engaged in the slate business in the country.

Another old and influential firm are the Hazard Slate Company, established originally in 1852, when the manufacture of slate was instituted. They are pioneers in the slate trade. For several years prior to the establishment of the firm in Fair Haven S. L. Hazard, secretary and treasurer and general manager, was connected with a similar enterprise at West Castleton. The plant is in Fair Haven, and is one of the largest and most fully equipped in the village. The company own an extensive quarry and manufacture nearly every variety of mill slate goods. Mr. Hazard is a manufacturer of large experience, and holds a high position among the slate manufacturers of the State. W. F. Parker is president of the company. In addition to his connection with the Hazard Slate Company Mr. Hazard is the proprietor of the Lake Shore Slate Company of West Castleton. He brings many years of active experience into every enterprise with which he is connected, and is a power in all important slate transactions.

No concern of Fair Haven has a more extensive business and acquaintance than the Fair Haven Marble & Marbleized Slate Company, who beyond question are entitled to a place at the head of the slate industry. The house has a history dating since 1859, when it was established as Hanger & Coulman. The present designation dates from 1866, when the company were organized. The company own valuable quarries covering 22 acres, and the works along the Castleton River embrace two large factories, covering 2 acres. There are large yards for storage purposes, and the mills are equipped with the most nearly perfect appliances used in slate manufacture. Water and steam are both used to operate the works. The company manufacture everything made from slate. The products are both marbleized and unmarbleized, every article being of superior design and workmanship. The company have recently brought out imitations of most of the modern decorative marbles, such as Mexican onyx, Numidian onyx and several other varieties equally attractive. These are produced in marvelously close imitation of the most rare and costly marbles. The firm are also introducing a line of beautiful and artistic church altars. The firm have the contract for the wainscoting of the church of St. Paul the Apostle, on Fifty-ninth street, New York City, and will also place an altar in the church. Charles R. Allen is president of the company, G. H. Shinville is secretary and treasurer, and E. L. Allen is general manager. E. L. Allen is a native of Hartford, N. Y. He was a representative from Fair Haven in the State Legislature in 1880, and in 1890 was a candidate for Governor of the State on the Prohibition ticket. All the gentlemen composing the company are exceptionally talented business men.

The Valley Slate Company are another important concern, having been established in 1883 as successors to the long continued business of R. E. Lloyd & Co. R. E. Lloyd, the treasurer, and virtually the proprietor of the business, was one of the founders of the firm of Lloyd, Williams & Co., and is one of the foremost men in the slate industry in Vermont. The quality of the slate produced by the company's quarries is known as unfading green, and has a large sale in all parts of the country. Mr. Lloyd is also a member of the firm of Lloyd & Jones. This latter firm operate a quarry adjoining the quarry of the Valley Slate Company. Both quarries are 3 miles south of the village of Fair Haven, and about 35 men are employed. Mr. Lloyd is engaged in the erection of a block on Main street, Fair Haven, to replace the block burned in January, 1893. The new block is 90 x 25½ feet and three stories in hight. The block will be finished in the spring.

Prominently representative among the slate quarries of Vermont is that of S. Allen & Co. The business was founded in 1868 by S. Allen, and has always enjoyed confidence and patronage of a most substantial nature. The works are near the depot, and combine a mill, with dimensions of 100 x 50 feet, and an office and yards. About 30 men are employed. The company manufacture nearly every variety of slate products, the wares being of first quality. R. C. Colburn is associated with Mr. Allen in the company. Both are experienced slatemen.

The Riverside Slate Company, manufacturers of milled slate stock, are another prominent firm. The company include A. H. Merriam, president; B. Merriam, treasurer, and W. K. Merriam, secretary. The works are near the depot. The company manufacture every variety of slate products except roofing slate, and are recognized as one of the substantial firms of the town.

Maley Brothers, manufacturers of marbleized slate mantels, are acquiring a good reputation as dealers of business integrity and promise. The firm are composed of J. Maley and M. K. Maley, who are rising men. They employ about 15 men, and the trade is constantly increasing.

Griffith, Owen & Co., slate manufacturers, whose works are known as the Scotch Hill Slate Works, are prominent dealers. The firm's quarry is about 2 miles from the village of Fair Haven, where is a mill 50 x 100 feet in size, which has four circular saws to prepare slate for marbleizing. The members of the firm are natives of Wales, and they manufacture a most attractive line of mantels and other marbleized products, all of which command the best prices.

One of the best equipped quarries in Western Vermont is the Eureka Quarry, about three miles south of the village. The quarries give employment to about 125 men. A. Tuttle, who is one of the promoters of the plan for adapting the power of the Castleton River, through the dam at Carver's Falls, is one of the proprietors of the quarries. He is one of the best informed quarrymen in the State. The products of his quarries are used in roofing, and find the greatest sale, shipments being made to London, Australia and Mexico. The shade of the slate is attractive and much sought.

Another old slate business in the vicinity is that of the Billings Slate & Marble Company, whose marble slate mill is at Hydeville, and whose quarries are near that place. The business was organized in 1854 and reorganized in 1876. C. W. Billings of Troy is president, and C. W. Tennant treasurer and general manager. The company have a capital of $50,000 and employ about 30 men. The company manufacture slate mantels in all varieties for architectural uses. The mill secures power from Lake Bomoseen. Mr. Billings has long been identified with the slate industry, and is a capable business man. Mr. Tennant, upon whom has devolved the immediate supervision of the works, is familiar with every detail of the manufacture and sale of slate products. He is a former resident of Troy, N. Y.

Near the above works are the plants of R Hanger, who makes a variety of products, and Bolger Brothers, who operate mills and quarries.

The Foundry Slate Company and McDonough & O'Day, other firms in this locality, produce slate mantels.

E. D. Humphrey quarries purple roofing of a superior quality, and Williams, Pierce & Hughes quarry purple slate for milling purposes, both firms having good veins and producing desirable material.

Jacob Warner, whose works are in Fair Haven, near the depot, established his business about ten years ago. He manufactures marble and granite products.

William H. Pelkey, formerly Pelkey Brothers, conducts electric slate works and a foundry for castings.

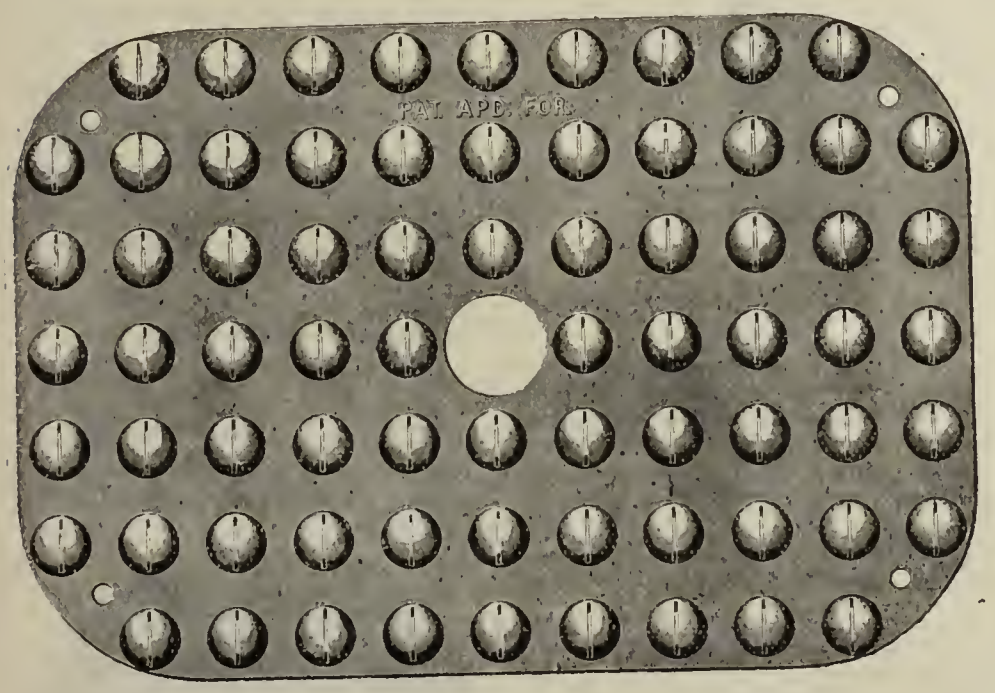
The William E. Lloyd Slate Company have some of the most extensive slate quarries in Fair Haven. The quarries are below the Eureka Quarries, and produce both purple and green slate. About 100 men are employed.

The quarries have a large capacity and are thoroughly worked. Mr. Lloyd has been continuously engaged in quarrying slate since 1865. His quarries produce roofing slate. He is successor to Lloyd, Owens & Co., his partners in that firm having been his brother, R. E. Lloyd, and Owen Owens. Mr. Lloyd has his son, William H. Lloyd, associated with him in the present enterprise.

Other slate manufacturers of Fair Haven are Minogue & Greer, H. H. Matthews, Robert Jones & Co, William Francis & Co., Roberts & Owen, Bennett & Felt, Minogue & Durick, James McNamara, St. Louis & Young and the Bonville Slate Company, all of whom do a good business during the season of activity in the slate industry.

A New Vapor Stove Burner.

The Michigan Vapor Stove Company of Grand Rapids, Mich., are using a new burner on their stoves, which is herewith illustrated. It is styled a "jet cone" burner. Each aperture as shown furnishes a jet of flame. The burner



A New Vapor Stove Burner.

shown is used on their 60 and 61 step stoves and has 72 jets. Round burners of the same description are used for the cooking holes. The 7-inch burner has 44 jets and the 5-inch burner has 21 jets. The company manufacture a full line of generator stoves, including step stoves, square tops, high juniors and juniors with single generators or individual burners.

The Naval Board that has been investigating the feasibility of converting the whaleback type of vessel into an auxiliary cruiser for war purposes has reported to the Department that these vessels are unsuited to the purposes of warfare on account of the impossibility of mounting heavy ordnance on board of them. The inventor and builder of the whaleback ships believed that it was possible to convert them into formidable coast defense vessels in time of war, but it is shown that only light rapid fire or machine guns could be carried on account of their light construction and limited deck space.

During last year 27,547 vessels entered and cleared at Canadian ports, as against 30,961 in 1892 and 31,321 in 1891. The total tonnage, however, last year was but little less than that of 1892, which was the highest in the history of the Dominion. It was 10,608,611 tons. A growing tendency is noted toward the construction of larger vessels every year. The number of vessels built in Canada in 1893 was 313, an increase of 35 over the previous year. As evidence of the decline in shipping values, however, it is noted that their average selling price has fallen from $37 per ton in 1868 to $11.50 per ton in 1893.

Utilization of Garbage.

The subject of the utilization of town refuse has been referred to from time to time in these columns, and it is one which is attracting an increased amount of attention in this country. In several cities of the United States there have been established various forms of crematories and destructors for garbage, but hitherto this material has not been turned to any very profitable account, as is the case in several European cities. The following details respecting the Livet process of utilizing city refuse will, therefore, be found interesting. This process is being favorably regarded in Europe, where it has been adopted in several quarters:

The Livet Process.

The Livet apparatus, as described by English journals, involves the rapid and economical generation of heat in furnaces and the utilization of dust and refuse for electric lighting. There is no novelty about the special objects of this process, which are: 1, The disposal of solid town refuse, whether wet or dry, by burning. 2, The utilization or the conversion of the products of the combustion of the said refuse into steam. 3, The employment of the steam so generated for electric lighting, for pumping sewage and for a variety of other purposes. 4, The manufacture of a kind of cement or mortar out of the residue or by-products of combustion, or the use of them, in combination with tar or bitumen, for footpaths and sidewalks, or the employment of the clinker for the foundation or bottoming of ordinary roads. The special feature of this furnace is that the form of the flues is such as will utilize the increasing weight of the products of combustion or gases as they travel toward the chimney, promote a high velocity of the air passing through the furnace bars, produce a rapid combustion with intense heat, and cause the gases themselves to pass sufficiently slowly through the flues to part with all their useful heat before they escape into the atmosphere.

English Methods.

The process is greatly facilitated by the fact that the solid refuse of English cities contains about 80 per cent. of mixed cinders and ashes, and thus provides in a great degree the materials for its own ignition and combustion. The method adopted in English cities is to deliver the refuse free of charge at the furnace mouth in a raw state, and shovel feed it into the fire without any preliminary drying, shifting or screening, an important point in the process. There is no unpleasant odor, as the high temperature and great force of draft secure complete combustion. The average quantity of rubbish burned per hour per square foot of grate surface of the Livet generator is 33 pounds, and 4 pounds of water is evaporated per pound of rubbish containing 20 per cent. of moisture. There is an excellent arrangement by which the flues are kept perfectly free and unclogged, even after months of use; the progression of the gases is partially arrested at the end of each flue, and the objectionable light dust is deposited in suitable expansion chambers or pits, which can be cleaned out as required.

Production of Electricity.

The value to a city of an effective apparatus for refuse utilization is shown in the recent installation at Halifax, England, which is equal to the production of current for the supply of 10,000 incandescent lamps of 10 candle-power for six hours a day, when 3000 tons or one-third of the rubbish of the city is burned. If the capacity of the plant were equal to burning all the rubbish produced, one lamp to each inhabitant could be supplied for three and a half hours daily.

While Coxey and others are marching on Washington with their hosts of "the unemployed," the farmers in the Eastern part of the country are crying out for more help, and the Free Immigrant Labor Bureau in New York announces that it is unable to meet the demands upon it for laborers. In the West, too, a similar condition of things prevails; prices for farm labor are higher than ever and the supply is inadequate.

The *Hungarian Metal Worker* says that an extraordinarily tough luting for pipes which have to stand pressure is made by mixing five parts of Paris white, five of ocher, ten of litharge, five of red lead and four of black oxide of manganese, very thoroughly together, and then adding a little asbestos and boiling oil.

The Canadian Minister of Public Works has entered into an agreement with the contractors by which they will complete the new Canadian Canal at Saulte Ste. Marie by July 1, 1894, for an additional grant of money.

Less cotton is being planted this year in the South, but more attention is being paid to cereals and other food products.

THE RETAIL STORE.

Stove Repair Orders.

Murphy, Maclay & Co., Great Falls, Mont., write as follows concerning the question of stove repair orders: "We have recently noticed letters from readers of the paper giving their systems of keeping account of stove repair orders. We have been using blanks similar to the inclosed, which have proven entirely satisfactory. We give the blank to the customer to fill out, requiring a partial payment in advance of ordering, so that the customer will be sure to call for the repairs when ready. The blank is self explanatory. We order from it and file it away until the repairs are received. On receipt of the castings we tag them, stating the name and number of the stove, the name of the person ordering and promptly notify the customer by mail that we have received his repairs. In this way we have done a large trade in stove repairs without loss of any kind."

The blank inclosed by our correspondent is given below:

MURPHY, MACLAY & CO.,
GREAT FALLS.

Order for Stove Repairs.

For Mr.....

We require a part payment in advance before ordering repairs. No exception to this rule.

READ OTHER SIDE BEFORE FILLING.

Null Name of Stove or Range.....
Full Number " " .....
Year Stove was Made.....
Latest Date of Patents.....
Is it a Coal or Wood Stove.....
Is it a Reservoir or Square Stove .....
Name and Address of Manufacturers .....

Repairs Wanted .....

COST OF REPAIRS SHIPPED BY FREIGHT.

	Per lb.		Per lb.
5 lbs. and over	$0.18	35 lbs. and over	$0.14
10 " "	.17	50 " "	.13
15 " "	.16	75 " "	.12½
20 " "	.15	100 " "	.12

These prices are for common castings and do not include nickel plated parts.

DO NOT WRITE IN THIS SPACE.

Date Ordered ..... Date Received.....
By Freight or Express.....
Of Whom .....
Weight of Castings..... Cost.....
Charges .....
Amount Paid..... Date.....
Due .....

It will be noticed that in one place the suggestion is made "Read the other side before filling." The matter on the opposite side of the blank consists of directions to be followed in ordering stove repairs; also of a broken view of a cook stove with all the plates numbered and the correct name of the parts given in tabular form below the cut.

Nested Stove Pipe.

The accompanying cuts show a nested stove pipe which Ruth, Patterson & Ruth, Alliance, Ohio, are manufacturing and marketing. The object of the inven-



Nested Stove Pipe.—Fig. 1.—Finished Joint.

tion is to devise a construction of joint which will be simple and economical in cost, readily packed into a small compass for storing and especially shipping, and put together without riveting or beating the seams. The end of one joint forms a band and encompasses the end of the adjacent joint and prevents



Fig. 2.—End View of Joint.

its spreading, while the seam is so formed that the joint will not give inward. The seam is formed by slipping the right edge into the groove on the left, and held in place by a rivet at the bottom. It will be seen that the lower end of each joint is the only part secured, and when put together, the upper

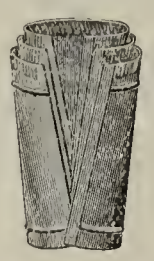


Fig. 3.—Pipe Spread and Nested.

end is slipped into the lower end of the joint above, thus forming a tight joint, as shown in Fig. 1, which can be easily taken apart and put together. Fig. 2 is an end view and shows construction of seam. Fig. 3 shows the upper end spread and nested for storing in shop or domestic use, the advantage of which is at once apparent when storing the pipe during the warm season, as a number of joints can be packed into a space not much larger than that usually occupied by one. Fig. 4 shows the pipe

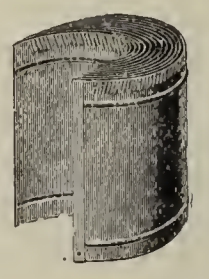
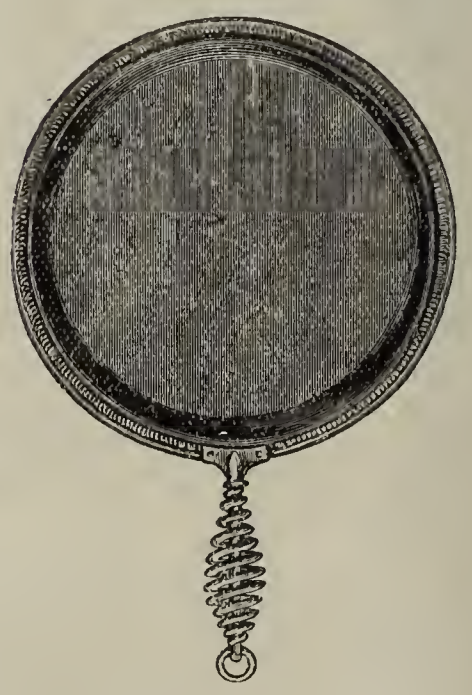


Fig. 4.—Pipe Packed for Shipment.

packed for shipment, and for this special advantages are claimed. It is pointed out that ordinary stove pipe is shipped as double first-class freight, while this is rolled and wrapped in paper and is shipped as fourth class and in car lots as fifth class. The pipe is made in the usual sizes.

Crown Asbestos Griddle.

Hall & Carpenter, Philadelphia, Pa., are introducing the Crown asbestos griddle, as here shown. It consists of a sheet of asbestos covered with a circu-



Crown Asbestos Griddle.

lar sheet of steel, which has a single bead around the outer edge, the whole held together by a corrugated tin rim, crimped on so as to hold both firmly together. The handle is of wire, nickeled. The griddle is 9 inches in diameter, and is suitable for a number of purposes where the quantity required is not large, such as frying eggs, mush, hominy, cakes, &c. The placing of asbestos between the fire and metal prevents burning or scorching.

Relief Wringers.

The accompanying cuts represent two iron frame wringers offered by the American Wringer Company, 99 Chambers street, New York. The metal part of the wringer, Fig. 1, is all of wrought and malleable iron, galvanized, and the japanned springs are directly over the bearings. The upper arms are each provided with a pin which fits into an opening in the lower arm, with a heavy rubber gasket between the arms at the pin ends to relieve the strain. The clamps are of the swing pattern, allowing adjustment to round or straight surfaces. The wringer shown in Fig. 2 is of the same construction as the former, but in addition is provided with cog wheels. The manufacturers state that by the use of the thumb nuts and spiral springs the pressure can be adjusted quickly for either heavy or light work, preventing the rolls from being overstrained, and increasing the wear of the machine over that of the ordinary iron frame wringer.

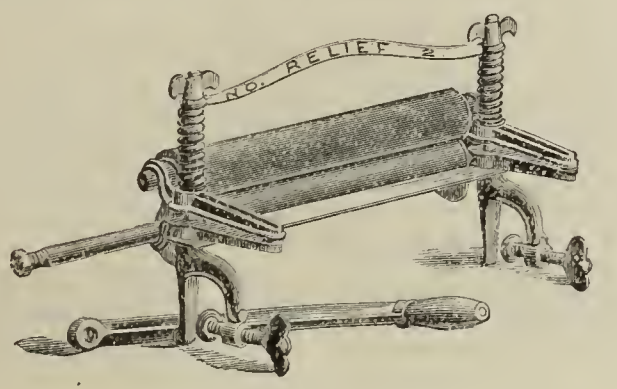


Fig. 1.—Relief Wringer.

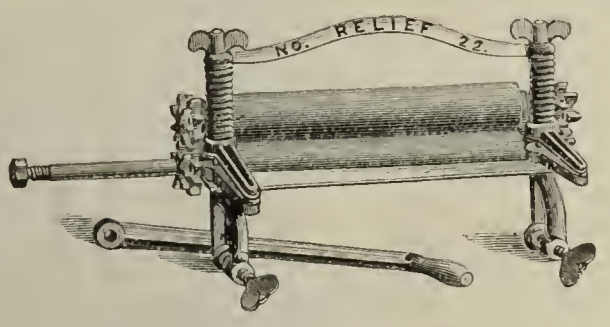
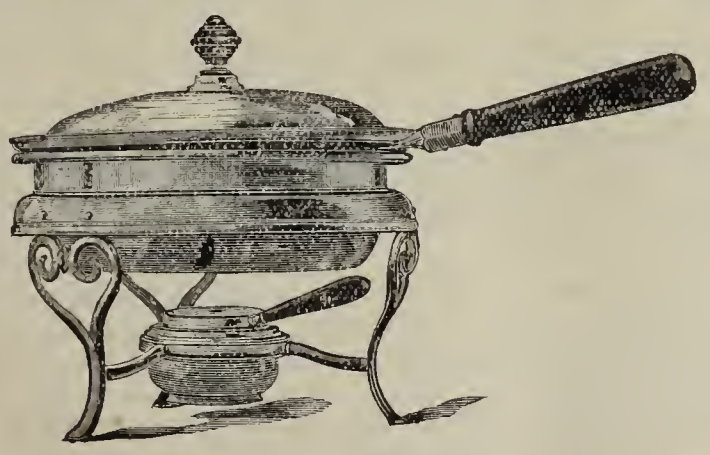


Fig. 2.—Relief Wringer with Cog Wheels.

Aluminum Chafing Dish.

The Wohler Aluminum Company, 65 Jackson street, Chicago, have just placed on the market an aluminum chafing dish, herewith illustrated. There are a number of peculiar properties of aluminum which render the metal peculiarly well fitted for purposes of this character. The metal is not affected by either heat or acids and yet is an admirable conductor of heat. The heat conductivity of the metal used in making a chafing dish is an important consideration, as the fuel used is alcohol, and the claim is made that cooking can be done in an aluminum chafing dish with about two-thirds as much fuel as would be required for some of the heavy plated dishes. The purity of the metal is another important consideration, as any kind of food can be cooked in such a dish with no danger of contamination. The chafing dish is made wholly of aluminum except the handles, which are of wood, as usual. No solder is used, and the parts are therefore indestructible. The dish is made either highly polished or satin finished, closely resembling silver plate or solid silver, while it costs about the same as silver plate. The same company will soon place on the market a highly finished and elaborate tea pot, which they say will be the first to be made in aluminum in this country. It will be made with polished aluminum spout and handle. About the same time they will bring out an aluminum rice boiler, for which the patterns are already made.



Aluminum Chafing Dish.

The Philadelphia *Record* publishes a list of 25 "tramp" steamers which were obliged to leave that port in ballast during the first ten weeks of this year owing to inability to secure cargoes.

The Ellis Warming Box.

J. T. Ellis, manager, box 262, Newark, N. J., is offering a warming box as illustrated herewith. The box, as shown without the cover by a two-thirds sized cut in Fig. 1, is entirely of metal with an opening in the center 1⅝ inches in diameter. The bottom of the box is solid and the air space between the inside and outside walls is covered by a brass rim. The inside wall is of fine brass wire cloth, and the outside wall of perforated metal. The heat is supplied by checker shaped carbon with a hole in the center, which is placed on a pin in the center of the opening. This is lighted with a match, after which the cover is put on the box, having lugs for holding it securely in place. Air is provided through the openings in the walls or sides of the box to allow of slow combustion; one carbon, it is stated, giving heat for about two hours. Fig. 2 represents the box in a ring or handle, which allows of handling the box when heated. The box is designed for relieving pain by the application of heat in a more convenient form than hot water bags, bricks, &c.; to be used in case of earache, neuralgia, toothache, lumbago, rheumatism, colic, &c. The point is made that the box may also be used to advantage for keeping warm the hands of street car drivers, conductors, policemen, coachmen, teamsters, postmen, mechanics, farmers, school children, also ladies when shopping, calling, walking or driving. The box with rim measures 3½ inches in diameter, weighs 5½ ounces and is finished in nickel plate. The manufacturer claims that the heater burns freely in the pocket or other receptacle without flame, smoke or unpleasant odor when closed. Twelve carbons accompany each heater and additional carbons are packed 100 in a box.

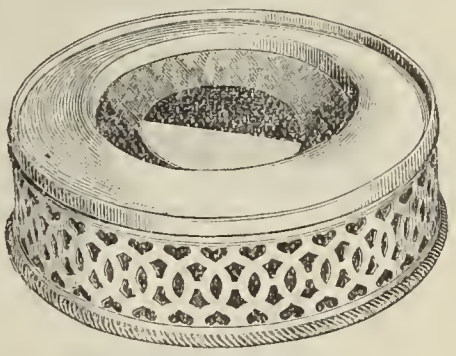


Fig. 1.—The Ellis Warming Box.



Fig. 2.—Warming Box in Ring.

Thomas A. Edison and Col. E. Gouraud have applied to the Court of Chancery, Newark, N. J., for the appointment of a receiver for the Edison United Phonograph Company. The bill claims that the directors of the corporation have pursued a policy contrary to the views of the holders of one-half of the company's stock, which has resulted in the wasteful and injurious operation of the concern and caused its insolvency.

STEAM AND HOT WATER.

The Ideal Water Heater.

We show in the accompanying illustrations a general and a sectional view of the Ideal water heater manufactured by the Ideal Boiler Company, Chicago, Ill., with temporary office at 88 Lake street, from where they will remove to 36 Dearborn street on May 1. The sectional view, Fig. 2, shows the interior water sections and the course of the circulation, while Fig. 1 shows the exterior form of the boiler, the method of connecting the sections, the position of the clean out doors, &c. Particular emphasis is laid upon the circulation of this heater. The water, it will be observed, enters on a level with the grate in the bottom section, flows around the fire pot and then enters a water column which communicates with the horizontal sections. These sections have the smoke holes staggered, so as to bring the products of combustion in more efficient contact with the surfaces. Each section is independent of the others and the manufacturers say is practically a separate boiler, so that when only a light fire is maintained the heated water rises directly to the flow pipe. The smoke flues in each section equal in area the opening for the smoke pipe. The hollow fire pot as shown in Fig. 2 is corrugated on its inner surface, and is furthermore slightly tapering in form, the grate diameter being larger than it is above, this shape, it is claimed, giving the most perfect combustion. The sections are fastened together by short bolts on the outside and the meeting surfaces are machine milled and made perfectly true. The only water joints are those which connect the sections together at opposite sides. It is pointed out that, if it is desired to increase the capacity of the boiler, other sections can be added. Furthermore, in case of accident, any section can be removed without difficulty.

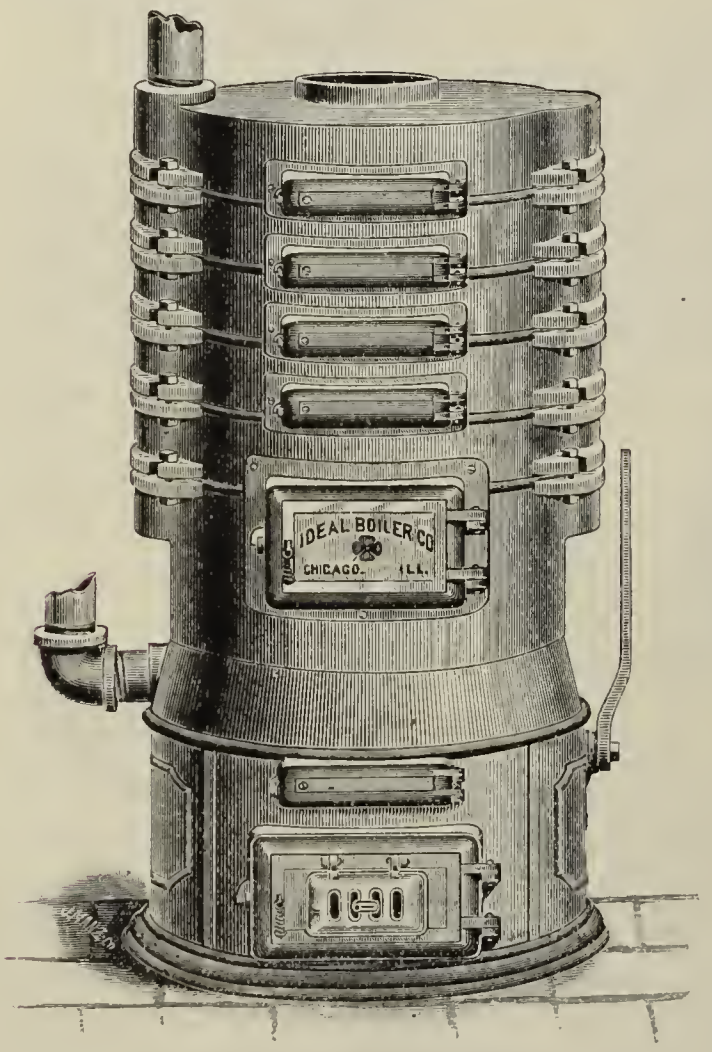


Fig. 1.—General View of Boiler.

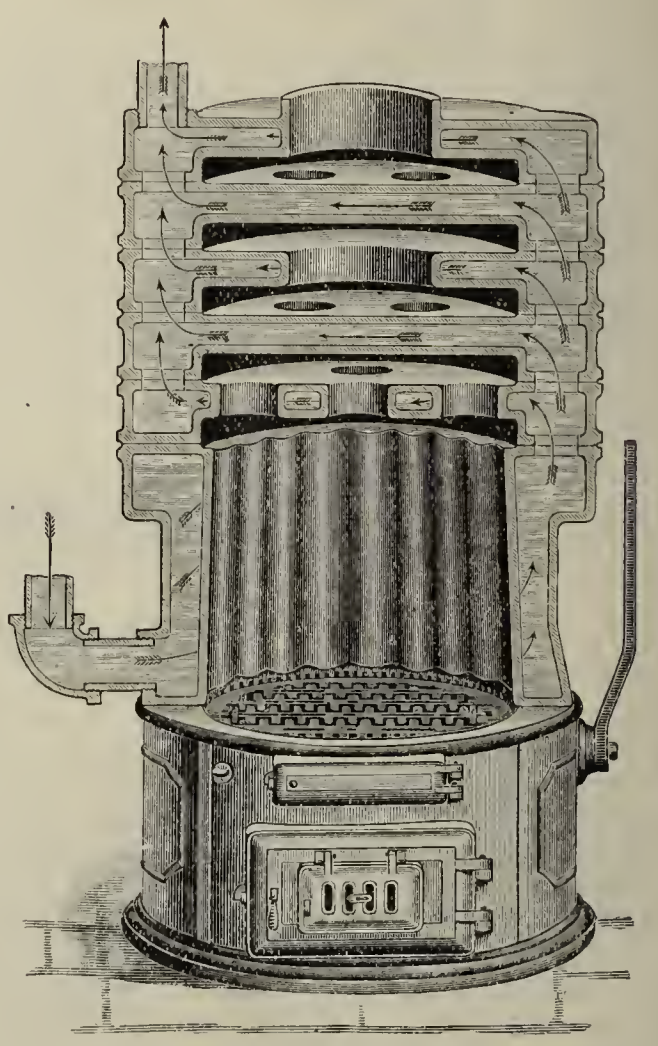


Fig. 2.—Sectional View.

THE IDEAL WATER HEATER.

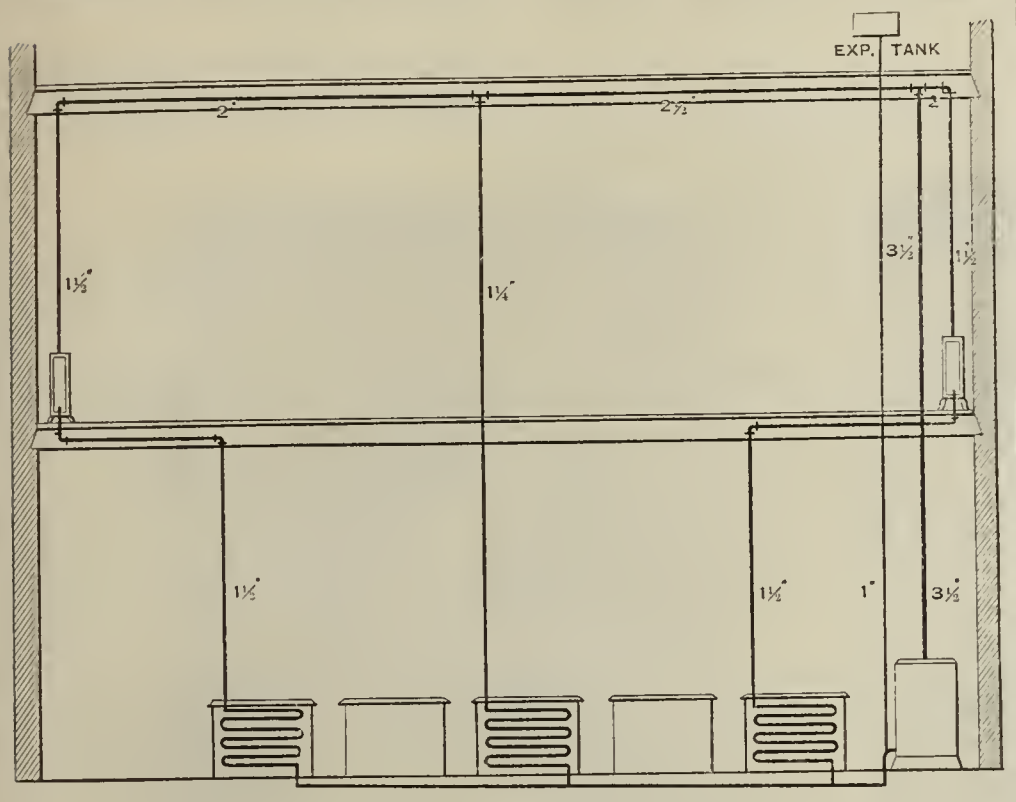
Radiation for Theater.

From MANAGER, *Nashville, Tenn.*—I have a theater to heat that seats on first floor 376 people, second floor 324 people and gallery 340 people. The stage has a very high ceiling and will be very hard to heat, and if it should be lacking in radiation when the curtain is raised a draft of cold air is thrown into the auditorium, making it very uncomfortable for the audience. We should allow something for animal heat in auditorium, taking an average house as a basis to figure from. I have had a great deal of trouble in getting the right amount of radiation in stage and auditorium, and would be glad for you to tell me through the columns of your excellent paper how strong to figure it. The building is to be heated with hot water.

Note.—Some of our readers have had experience in this line of work and we hope they will give the rules they have used. On consulting a number of engineers there is a similarity of opinion that each case requires different handling, and with direct radiation there is more difficulty in avoiding air currents than with an indirect system. There is less probability of air currents if the same radiation is used, in proportion to the space, back of the curtain as in front of it. In the locality from which the inquiry comes it is probable that with hot water 1 square foot of surface would be sufficient for 200 cubic feet of space. The radiation used back of the curtain is preferably arranged along the outer walls.

Wants a Heating System.

From W. A. T., *Buffalo, N. Y.*—If our Tennessee friend who asks for a heating system in *The Metal Worker*, March 10, had given a plan of his 22 x 125 feet dry goods store, less difficulty would be encountered in assisting him. I give a plan of a supposed store and a method of installing a hot water plant for heating it. As the expense of a basement is to be avoided, the boiler must set on the first floor unless there is space behind the store to erect a building to set it in, which would but slightly change the general arrangement shown in Fig. 1, and would not interfere with the operation. As the upper floor will be more easily heated, 1 square foot of heating surface will be sufficient for 70 cubic feet of space, as the piping aids in heating. On the first floor 1 square foot of surface is used to 50 cubic feet of space, as the water in four of the radiators will pass through the upper radiators before reaching them. On the upper floor the surface has been placed in four radiators of 100 feet each, two at the front and two at the back of the building, as shown in Fig. 2. On the lower floor six coils of 100 feet each are placed in front of the counters, one on each side of the store, at the front, middle and back, as shown in Fig. 3. The radiators in the middle of the store are fed with a pipe direct from the main, but the front and back radiators are fed by the return from the upper radiators. The floor of the store will have to be taken up to run the return, and all of the branches should be connected to it with Y fittings. The return should have a fall all the way to the boiler, then rise and connect with it. The highest point in the system should be where the rising flow main branches, and an air valve should be placed there, and from this point there should be a slight fall in all the pipes to let the water as it cools fall back to the boiler. A pipe should be connected with the return at the boiler and run up to the expansion tank located above the top of the flow main, and in the space above the second-story ceiling if there is room. Another method of heating the lower floor would be to arrange the coils on the ceiling, which would avoid running the return under the floor, but as the greatest heat would be on the heads of the clerks and customers it is doubtful if such a labor saving plan would be advisable.



Wants Suggestions on Heating.—Fig. 1.—Showing General Arrangement.

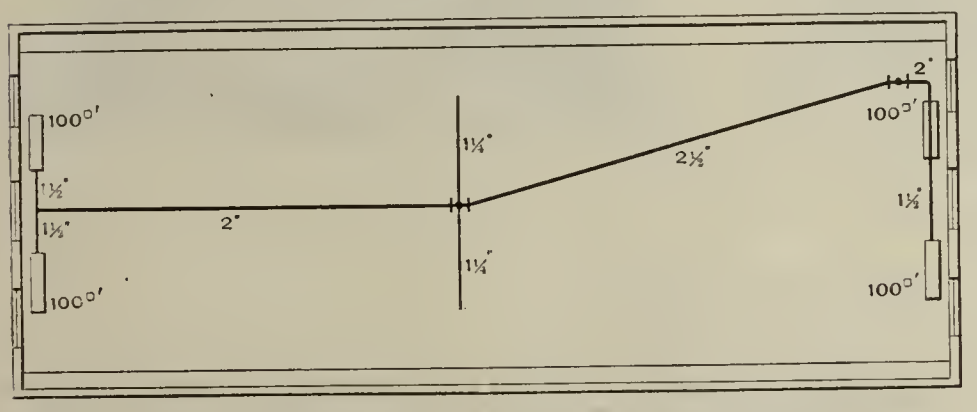


Fig. 2.—Plan of Second Floor, with Flow Main and Radiators.

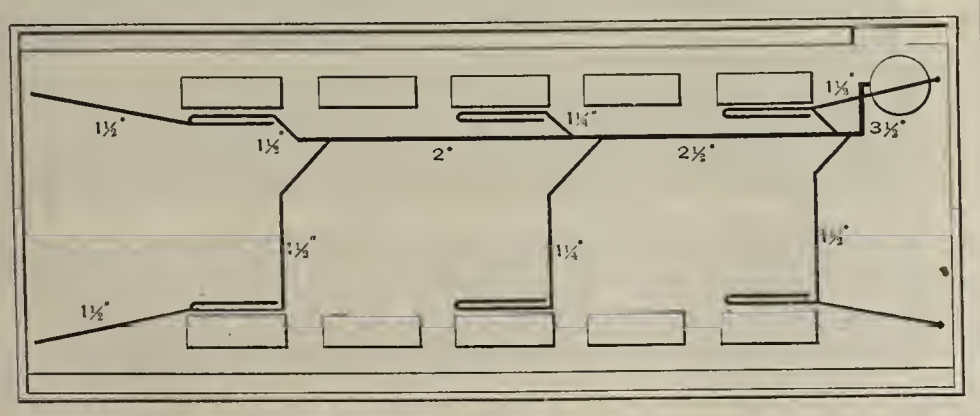


Fig. 3.—Plan of First Floor, with Coils and Returns.

Automatic Pump Governors.

In *The Metal Worker*, March 24, was an article entitled "The Value of Exhaust Steam for Heating," which described a system of returning the water of condensation to the boiler by means of a steam pump and an automatic pump governor. After the publication of the article we were informed that the essential feature of the system, which was the automatic pump governor, was controlled by patents owned by the Albsny Steam Trap Company, Albany, N. Y., who had licensed Timothy Kieley, 7 to 11 West Thirteenth street, New York, to manufacture the governors, and that litigation was now in progress with other manufacturers. We quote as follows from a letter received from the Albany Steam Trap Company in reply to our inquiry respecting their interest in the patents and system:

The pump governor or regulator is the main feature of the system you described in the article in *The Metal Worker*, March 24. There are several parties making these devices, and as we believe in violation of our patented rights, as we are the owners of the patents numbered 207,483 and 207,485 fully covering the automatic regulation of steam pumps for returning the water of condensation from steam heating systems under pressure. We have a suit against the Worthington Pump Company, claiming that they infringe the claims in the patents above named. We have licensed Timothy Kieley of your city to manufacture pump governors under our patents. All other manufacturers of pump governors controlled and operated by the condensed water of the heating systems we claim are infringing our patents.

T. C. Joy & Co., Titusville, Pa., manufacturers of the Joy flue radiators, with offices at 48 Centre street, New York, and 96 Lake street, Chicago, are sending out a circular with a list of the large buildings, with the names of the architects and heating engineers, where their radiators are used. Two carloads of radiators were recently received for the Manhattan Life Insurance Company building, in which Gillis & Geoghan are installing the heating plant.

R. T. Crane of the Crane Company, Chicago, has been superintending some of the transfers connected with the purchase of Huntington-Hopkins Company stock of pipe and fittings at San Francisco, Cal.

Scollay's Improved Boiler.

The accompanying illustrations show the improved hot water boiler being placed on the market by John A. Scollay, 74 and 76 Myrtle avenue, Brooklyn, N. Y. Fig. 1 shows the complete boiler, and Fig. 2 is a sectional view showing the internal arrangement. It has a labor saving grate and the lower fire pot is lined with fire brick. Above these is the water chamber, or dome, with an inner chamber directly over the fire which has both corrugated surface and projecting tapering studs to increase its efficiency as a heat absorbent. The inner chamber connects with the outer chamber both at the sides and at the top. The flow and return main connections are at the top and bottom of the boiler. A draw off cock is placed at the bottom to empty the boiler. The boiler proper has an outer non-conducting casing with a casing ring so made and placed as to form a baffle plate to cause an indirect draft. There is a smoke outlet at the back connecting with the boiler both at the top and at the bottom, and when the damper at the top is open there is a direct draft, but when it is closed there is a full reversed indirect draft. The boiler is known as the C series and is made in four sizes rated to carry from 250 to 1000 feet of radiation. Some of these boilers have been used for both residence and greenhouse heating during the winter with satisfactory results.

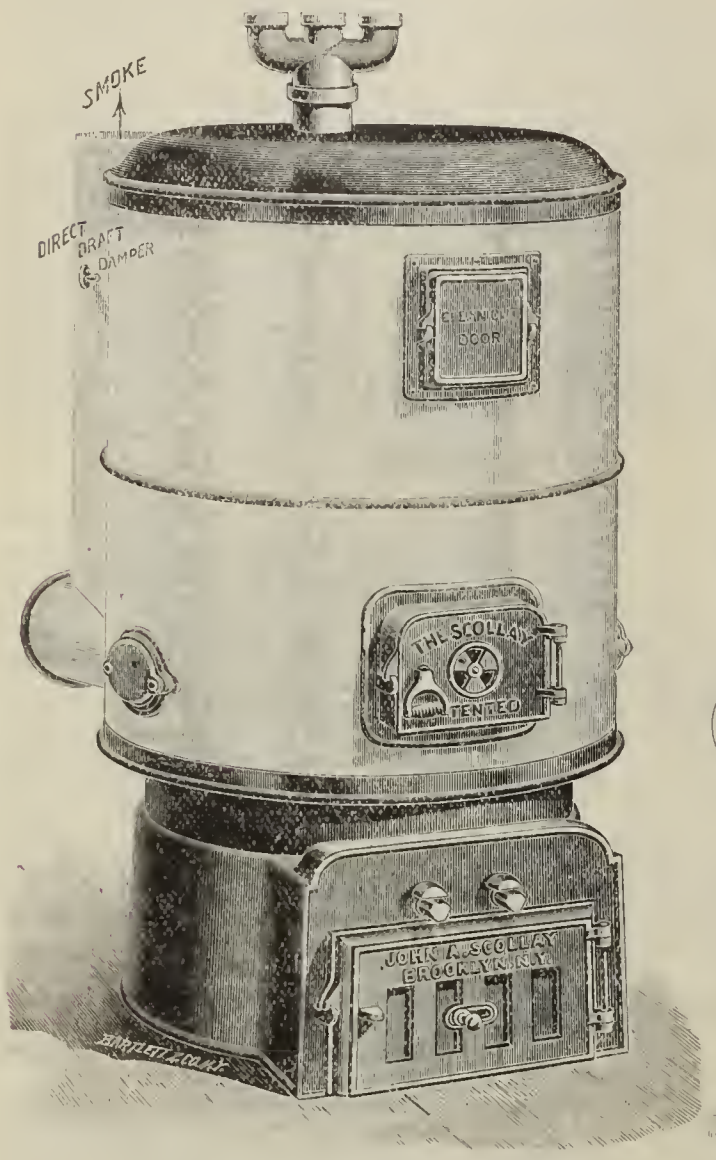


Fig. 1.—Showing Boiler Complete.

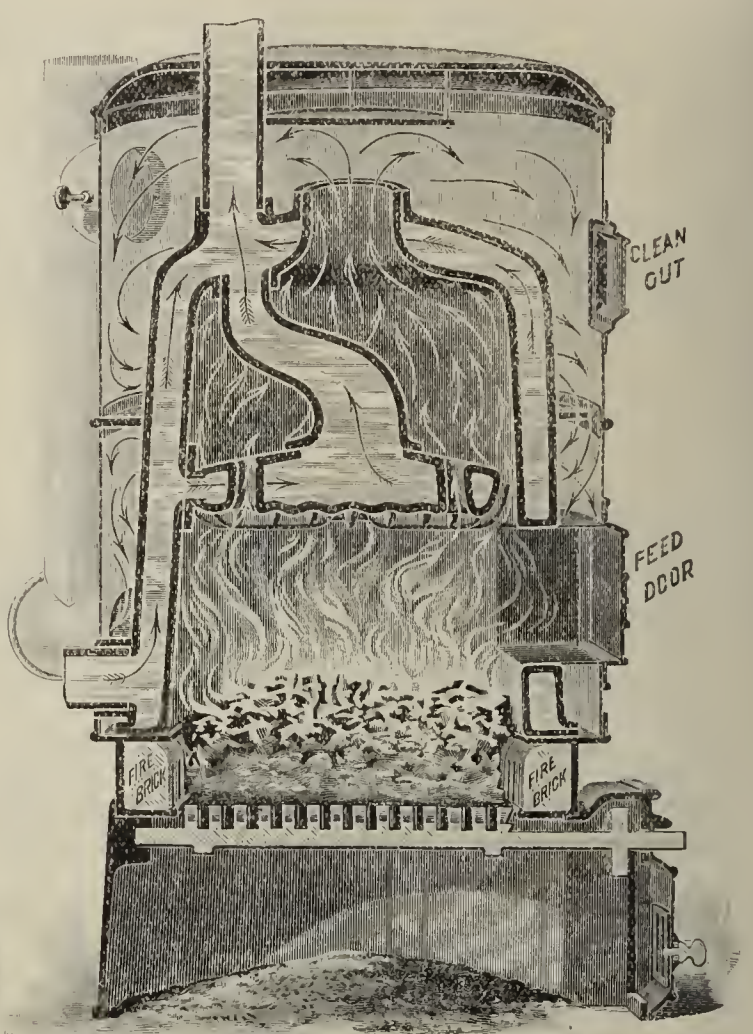
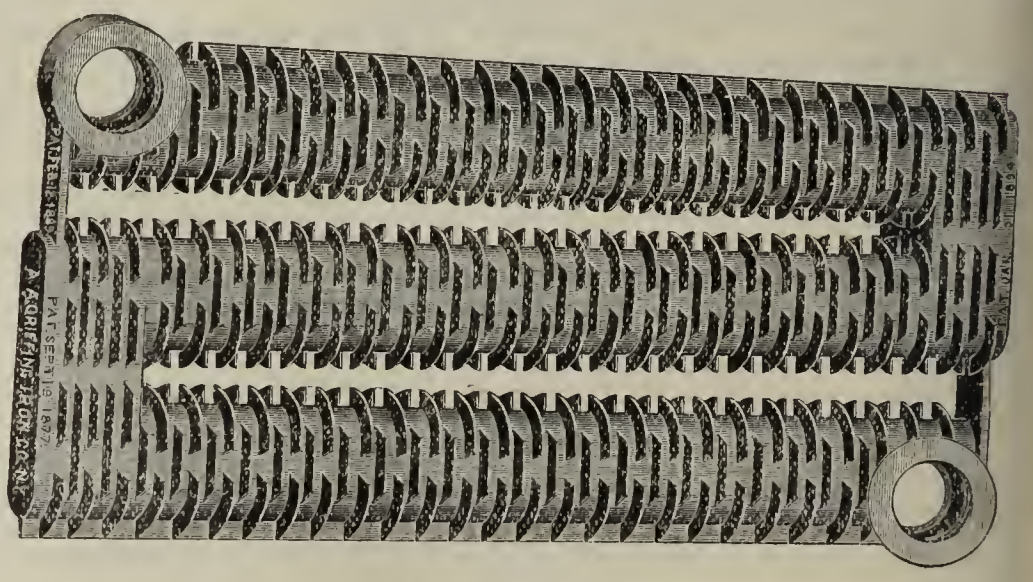


Fig. 2.—Sectional View.

SCOLLAY'S IMPROVED BOILER.

The Bundy Newport Radiator.

The illustration herewith shows a section of a new indirect radiator made by the A. A. Griffing Iron Company, Jersey City, N. J. It is of the extended surface character and each section has three arms. The sections are 37 inches long, 3½ inches wide and 15 inches deep, and are made up into stacks, with heavy 2-inch right and left hand hexagon nipples. They are equally adapted for use with steam or hot water, the openings being at the extremities and the return opening below the water way of the radiator to aid a gravity return. The construction, it is said, insures a positive circulation of either water or steam.



The Bundy Newport Radiator.

The Ideal Boiler Company have recently been incorporated in Chicago, with a capital stock of $100,000, and will manufacture and put upon the market a complete line of steam and hot water boilers. It is the purpose of the company to manufacture boilers with circular fire pot and horizontal sections, and also boilers with square fire pot and vertical sections, with a

view of carrying a line of house heating boilers which shall be surpassed by none in the trade. The president of the company is Geo. E. Downe, late president of the National Hot Water Heater Company, who is well known to the trade in all sections of the country. The new company have leased for their Chicago headquarters the store at 36 Dearborn street, recently vacated by the American Boiler Company.

HEATING NOTES.

The United States Heater Company, Detroit, Mich., send out a card illustrating their line of heaters, which includes the Capitol, Mascot and Hecla.

H. Gilbert Hart, of Hart & Crouse, Utica, N. Y., manufacturers of the Royal line of heating apparatus, will sail for Europe next Tuesday.

The Exeter Machine Works of Boston, Mass., manufacturers of the Exeter steam and hot water radiators, have made arrangements with the John Simmons Company, 106–110 Centre street, New York, to handle their goods exclusively in New York State. They are prepared to fill all orders promptly.

The Model Heating Company, Philadelphia, are sending out a handsome piece of printing in the interest of the Novelty Circulator. It is a four-page card, with a half-tone engraving on the first page of the Novelty Circulator in the latest form, with the text in red and dark green, while the last page is devoted to dimensions, ratings and prices.

Geo. B. Cobb & Co., 96 Centre street, New York, have bought out the Welsbach Light Company's Harlem branch store, at 155 West 125th street, where they purpose establishing an uptown branch of their steam and hot water heating business. Their fine display of gas stoves, ranges and Welsbach lights indicates that their gas appliance department, under the superintendence of A. J. Doty, is in very capable hands.

Hart & Crouse, Utica, N. Y., had as a visitor this week Manager W. M. Mackay of their steam and hot water department, at 211 Water street, New York. Mr. Mackay states that the New York Central road is preparing to lay a branch into their new works, which will soon be in course of construction.

The D S. Morgan Boiler Company, 23 West Lake street, Chicago, have released their present location for a term of years.

The Smith & Anthony Stove Company, 217 Lake street, Chicago, have secured the agency of the United States Radiator Company, and will carry a full line of their Splendid radiators.

We are indebted to the Richmond Stove Company, Norwich, Conn., for a batch of the pretty catalogues that they are issuing in the interests of their agents. They are small, neatly published and printed pamphlets, containing descriptions and illustrations of their steam and hot water heaters, and each one is issued in the name of some special firm, and at the back of the different pamphlets are testimonial letters from persons who have used the Richmond goods in the neighborhood of the agent. One of these pamphlets carries the name of the Fall River Steam & Gas Pipe Corporation, 93 Pleasant street, Fall River, Mass.; another is issued in the interest of Abram Knowles, New Bedford, Mass.; a third is issued for Paul B Patten, 16 Lafayette street, Salem, Mass.; a fourth for J. H. Alvord, Winsted, Conn. A fifth pamphlet, of larger edition, carries on the front cover and title page the firm name of Isaac Coffin & Co., 52 Sudbury street, Boston, Mass.

W. B. Wilkinson, at 210 Water street, manager of the New York branch of the Howard Furnace Company of Syracuse, N. Y., is showing a method of connecting a combination hot water and hot air furnace with a radiator. The furnace is near a column which supports an expansion tank near the ceiling and a radiator beneath, with all the piping, angle valves and air valves, just as required in practice.

"Royal Heaters: Hart & Crouse, Utica, N. Y.; 211 Water street, New York. Steam boiler catalogue, 1894," is on the cover of a 24-page catalogue which has just reached us. In it are several desk blotters printed in two colors, proclaiming the features and attractions of the Royal line of heating apparatus. The catalogue is devoted to describing the Royal steam heater, with cuts showing construction and operation. Two pages are devoted to ratings for both residences and greenhouses. A full list of the trimmings of the heater is given, with instructions for setting it up and directions for using it.

The Harell Steam Heating Company, Dunkirk, N. Y., have by special act of the Legislature assumed the name United States Radiatior Company. They manufacture cast iron radiators exclusively and the name Harell Steam Heating Company was misleading, inasmuch as many of the trade assumed that they were engaged in the steam heating business. The new name is comprehensive and appropriate and the management have shown excellent judgment in its selection. We understand that they are erecting new buildings and increasing their output in order to meet the demand for their Splendid radiators. The firm expect to issue a catalogue illustrating and describing their different specialties and which they will distribute to the trade.

Alfred Emley of Emley & Sons, Limited, dealers in marble and plumbers and heating engineers, of Newcastle-on-Tyne, England, was a guest of J. A. Goodrich of the American Radiator Company at 92 Centre street, New York, this week. He visited a number of houses in the heating goods and fitting and supply trade, and expressed surprise at the conveniences of the goods used here. He is now making a more extended tour through the United States, and it is probable it will result in some trade in goods manufactured in this country.

W. M. Mackay, manager of the steam and hot water department, at 210 Water street, New York, of Hart & Crouse of Utica, is displaying a Royal hot water heater, set up ready for use, in front of the store. It is attractively painted and decorated.

Visitors to the American Radiator Company, 92 Centre street, New York, will notice that their showroom has been pleasingly rearranged. The back portion of their building is now divided from the showroom by hardwood and glass partition, which includes a private office for J. A. Goodrich and coat and toilet rooms. Back of these are arranged storage closets and shelves for stationery and filing correspondence. Immediately in the rear are the warerooms, the basement floor being used for both the storing and construction of radiators. The ground floor is used for preparing radiators for shipment. Iron strapped wooden cases are more frequently seen as the foreign shipments are on the increase. The beauty of the radiators made in the United States finds a market for them in Europe, South America and Japan. At the front of their showroom radiators of artistic decoration are shown. Radiators in imitation of porcelain are exhibited and decorated in a harmonious combination of coloring and enlivened with gold. In contrast radiators are shown in various electro-bronzes from deep copper to bright brass, and the new aluminum bronze for radiators is a novelty in ornamentation.

The Kewanee Boiler Company

of Kewanee, Ill., and Dearborn and Lake streets, Chicago, have brought out a new and very comprehensive catalogue, No. 3, covering boilers of all kinds for power and heating. This catalogue is of pocket size and contains 128 pages. An introductory chapter gives some particulars about the company's new factory, which is equipped with the most modern boiler making machinery, including hydraulic riveters, hydraulic cranes up to 20 tons capacity, pneumatic lifts, machines for flanging heads and fire boxes, large bending rolls, plate planers, punches, &c. Attention is next called to the high quality of materials used in making the various products turned out by this company and the very thorough tests given all boilers before leaving the works. The catalogue proper begins with illustrations of power tubular boilers, which are shown in different settings and in a variety of styles. These are fitted with the Ætna shaking grate, the Kelly rocking and dumping grate, the Haxtun rocking and dumping grate, Burnham's patent rocking and dumping grate, or common grates. Next come fire box flue boilers for steam heating, vertical tubular boilers, vertical flue boilers, feed water heaters, &c. The Anderson steamer is an apparatus for cooking food for stock or for use in slaughter houses. A line of water heaters is made for laundry and bath purposes. Receiving tanks for steam heating apparatus are shown. The company manufacture all kinds of tanks.

Special attention is called to the Haxtun boiler for steam and water heating. It can be used for hard or soft coal, and is a base burner with either fuel. Illustrations of this boiler are given in brick setting, with part of the brick work removed, in cross section, showing the distribution of water, &c. Several patterns of grates are made for this boiler, illustrations and descriptions being given of each style. The company are jobbers of steam and water supplies, furnisbing complete outfits of pipe, fittings, radiators, valves, gauges, &c., for steam and water heating systems. The catalogue contains very full price-lists of these supplies, as well as of the company's own products.

A new material for paving is being introduced into London. It is composed of granulated cork and bitumen pressed into blocks, which are laid like bricks or wood paving. The special advantage of the material lies in its elasticity. In roadways it furnishes a splendid foothold for horses, and at the same time almost abolishes the noise which is such an unpleasant feature of city traffic. It is used in Australia with good results.

ROOFING AND CORNICE.

Roof Flashings.

From B. W., *Milwaukee.*—One of the important parts of a roof is the flashing, or connection between the roof and wall. One of the first methods I used for the purpose is shown in Fig. 1. The tin was laid in the wall by the mason, thus securing a tight joint. After the roof was laid the flashing was bent down and out so it could be nailed to the roof. In this instance tinned nails were used, so they could be easily soldered. In time the nails worked through the solder and caused leaks. When nails are to be used as shown in Fig. 1, it is best to drive them through this joint should break, it is supposed the bent tin behind the flashing would prevent water from entering the building. Some tinners prefer to have a 2 x 4 strip laid in the wall, as shown in Fig. 5. After the brick work is finished, the joint above wood can be cut out by means of a coarse saw, then after sweeping the roof boards the flashing can be placed in position and secured by nailing into the wood. The joint is to be cemented in the usual manner. A strip of tin can be laid in the wall and then bent over the roof tin, as shown in Fig. 6, or a lock joint can be made between the two, as shown in Fig. 7. By the methods thus far presented the flashings have been placed against the wall, thus producing a right angle. Some tinners prefer to have the flashing placed at an angle, as shown in Fig. 8. A strip of wood is secured to the roof boards, and against this strip the flashing is laid; thus abrupt bends are avoided.

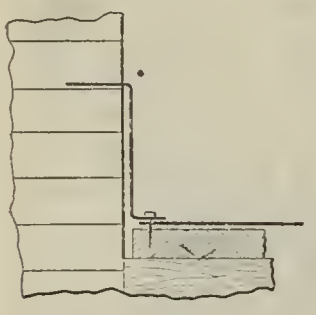


Fig. 1.—*Head of Roof Nail Exposed.*

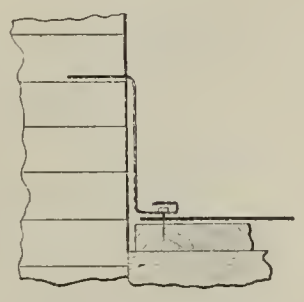


Fig. 2.—*Head of Roof Nail Covered.*

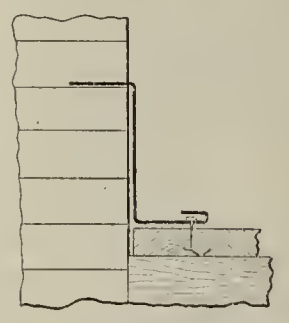


Fig. 3.—*Lock Turned on Flashing.*



Fig. 4.—*Flashing Bent Over Roof Tin.*

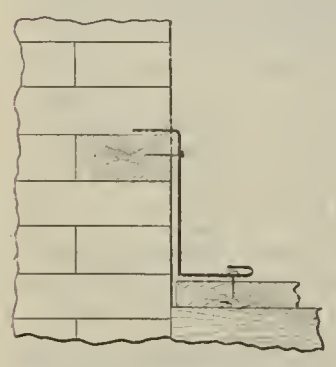


Fig. 5.—*Flashing Nailed to Wood in the Wall.*



Fig. 6.—*Strip of Tin Bent Over Roof Tin.*

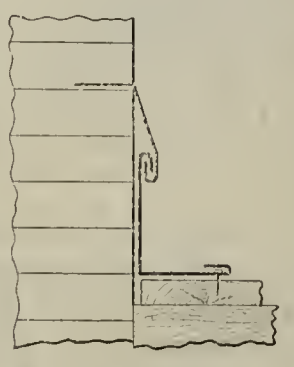


Fig. 7.—*Strips Joined by Means of Lock Joint.*

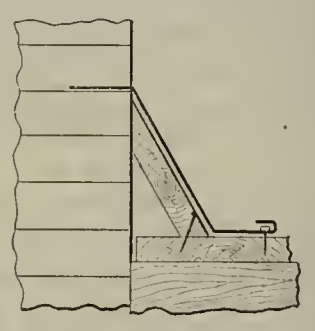


Fig. 8.—*Strip of Wood Placed Behind Flashing.*

ROOF FLASHINGS.

strips of tin cut about ⅓ x 1 inch, thus allowing the ends of the strips to be bent over the nail heads and soldered. Another method of securing the flashing to the roof is shown in Fig. 2. After the roof is laid the flashing is bent down and out, then an edge is turned up so the flashing can be nailed, when the edge is turned over and soldered. While this method allows the nail heads to be covered, two edges are to be soldered in the place of one, as in the previous instance. By laying the flashing in the wall, then bending down and out, as shown in Fig. 3, a lock can be turned over and secured to the roof boards by nails or cleats, when the roof tin can be joined in the usual manner. In Fig. 4 the roof tin is shown bent up against the wall. After the roof has been soldered the flashing is bent down and soldered to the roof, and if

FLASHINGS.

We are indebted to J. H. Eller & Co., Canton, Ohio, for a copy of their handsome illustrated catalogue for the current year. It is a volume of nearly 100 pages, bound in colored paper with raised design on the front cover printed in bronze. It is the eighth edition of the catalogue, and in it the manufacturers call attention to several new features, especially their improved lock seam steel roofing, plain, round and octagon expansion conductor and a full line of cornices, cresting, finials, vanes, &c The volume begins with general remarks on the construction of steel roofs and rules of measurement and other matters of interest to the trade. This is followed by sectional and other illustrations of roof seams and methods of laying roofs. The next division is given up to corrugated iron of different sizes of corrugations, weather boarding, crimped iron, beaded iron, hip coverings, pressed steel brick, rock faced brick, siding, &c. Then comes the division of the catalogue relating to galvanized iron and tin eave troughs, corrugated and plain round conductor pipe, elbows, shoes, cut offs, strainers, &c. Round and octagon expanding conductor, galvanized iron cornice, crestings, finials, ornamental hip caps, weather vanes, &c. The book is profusely illustrated, and in addition to the prices full information is given of the articles referred to.

The East Birmingham Iron Roofing & Corrugating Company, Birmingham, Ala., distribute a highly ornamented postal card, which calls attention typographcally and pictorially to their pressed standing seam roofing.

Charles Schaeffer, one of the best known sheet metal workers of Chicago and for years a writer on practical subjects for the trade press, has engaged in the cornice business with his brother. Their establishment, which is styled Schaeffer's Cornice Works, is located at 1014 to 1022 Central Park avenue, cor-

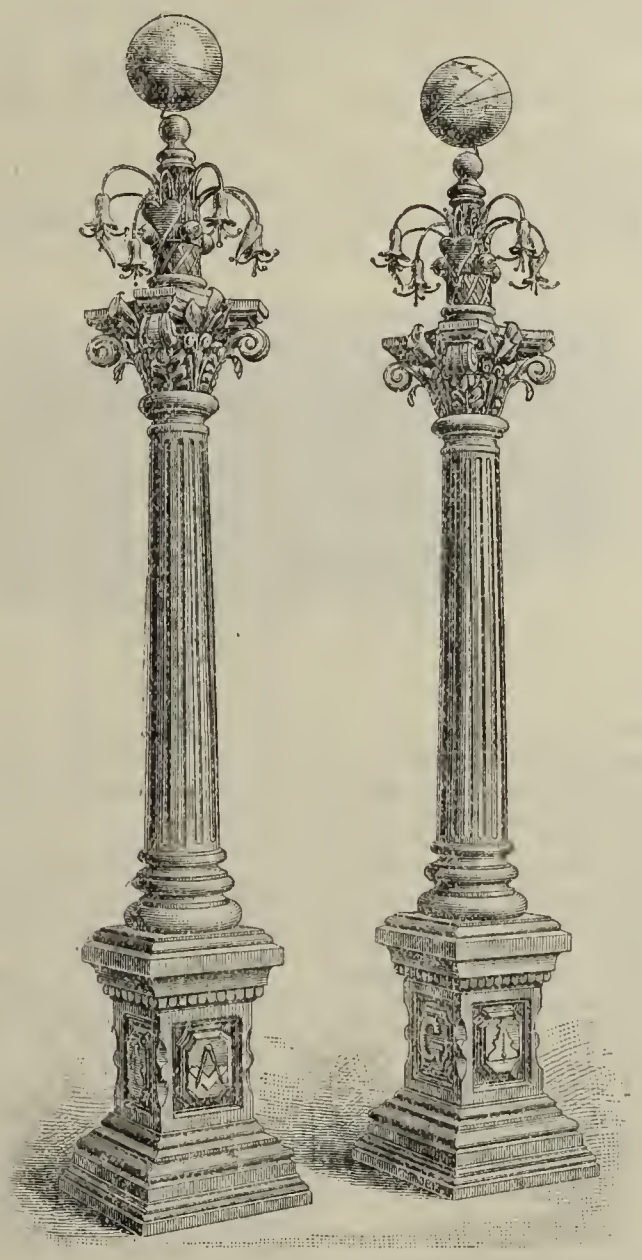
ner of Twenty-second street, Chicago. They make a specialty of artistic and round work.

THE ACME ROOFING COMPANY, Canton, Ohio, issue a handsomely published illustrated catalogue and price-list of their manufactures, which include a full selection of sheet metal goods in the roofing and kindred lines. The first articles noted are eave troughs and gutters with gutter hangers. Then come conductor pipe and conductor heads, followed by elbows, rain water cut offs, ventilators and ridging. Cresting blocks and finials are illustrated in many styles. A number of pages are given to cornices, showing a number of different architectural designs. Finials are likewise illustrated and then attention is given to skylights. The second section of the catalogue is devoted to roofing, and the goods noticed are the Acme standing seam steel, roll cap, double seam, folding seam, pressed standing seam, corrugated pressed standing seam, corrugated iron siding, steel pressed brick, weather board siding, ceilings, &c. The volume is profusely illustrated and is indexed at the back. The cover is of heavy colored paper with the name and address stamped on the front and printed in gilt.

MESSRS. HILL & MCGINTY, who have wbeen for many years ith E. B. Badger & Son, Boston, Mass., have started in business for themselves at 20 and 22 Pitts street as sheet metal workers, coppersmiths and roofers. Mr. Hill was confidential clerk and bookkeeper for Messrs. Badger & Son for 25 years and Mr. McGinty has been with them as foreman for the past 15 years. Their former associates gave Messrs. Hill & McGinty a handsome oak roll top desk last Saturday, the presentation speech being made by Thaddeus Flynn.

Sheet Metal Columns.

We present in the accompanying engraving an illustration of a pair of sheet metal columns that will be of interest to many of our readers. The following letter, which was received with the photograph of the work from Barrett, Hicks & Co., Fresno, Cal., contains a brief description of it:

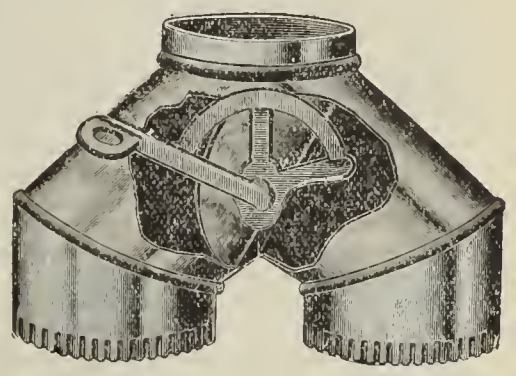


Sheet Metal Columns.

We inclose you photograph of a piece of work just completed by our cornice maker, Jack Dressel. It is a little out of the ordinary line and our Masonic friends will immediately recognize what the columns are intended for. The columns are made of galvanized iron, except the leaves, flowers and work around the capitals, which is hammered copper work done by hand. All columns of this kind which we have ever seen have been made of wood, and as our weather is so hot in summer it occurred to us that these could be gotten up of galvanized iron to stand any weather and any climate. So we undertook the job, and think we have made satisfactory work of it. The columns are 22 inches square at the base and 12 feet high. The globes on top are 12 inches in diameter. The shaft can be removed from the base, which is intended to be filled with sand.

The Acme Rain Water Cut Off.

We show in the accompanying illustration a broken view of the Acme rain water cut off, manufactured by the Acme Roofing Company, Canton, Ohio, and on which a patent is pending. Special attention is directed to the simplicity of its construction and to the fact that it cannot be turned by the water. It is pointed out that there are no springs to get out of order, break or become loose. The Acme cut offs have been manufactured and sold for a year, and wherever used have, we understand, given excellent satisfaction. The cut offs are made of the best grade IX bright plate, japanned, and also of galvanized iron, in all sizes.



The Acme Rain Water Cut Off.

Net Price of Galvanized Sheet Iron.

We have had a number of inquiries for copies of the table giving the net price of galvanized sheet iron which was printed in *The Metal Worker*, April 7. We have, therefore, issued the table in more permanent form, published on manilla card suitable for shop and office use. The card will be sent on receipt of 10 cents by David Williams, 96–102 Reade street, New York.

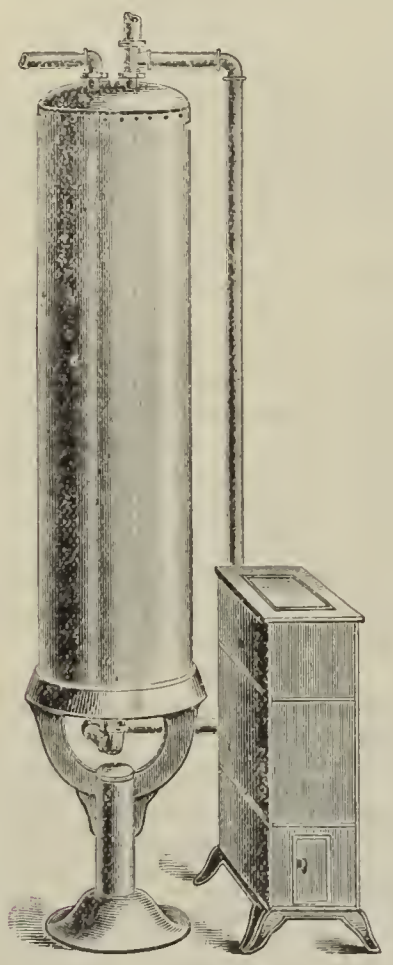
Senatorial obstructionists at Washington would do well to ponder the methods of the Canadian Parliament in the dispatch of financial business. Canada's new tariff went into effect on March 27, a few hours after it had been brought down to the Assembly by the Minister of Finance. At 3 o'clock that afternoon all the telegraph lines were monopolized by the government, and by 8 a.m. the next day every custom house in the Dominion—some 800 in number—was in possession of the new tariff in full.

According to the *Puget Sound Lumberman*, the output of lumber in the State of Washington for 1893 was of the value of $10,700,000, in addition to $2,636,000 of shingles. The figures in feet were: Lumber, 764,234,912; shingles, 1,829,528,500. This was greater than the output of Oregon, British Columbia, Montana and Northern Idaho combined.

PLUMBING and GAS FITTING.

Vulcan Water Back.

W. M. Crane & Co., 838 Broadway, New York, are introducing the Vulcan water back, as here shown, to be used in connection with gas. It is made of cold rolled steel and angle iron in two sizes. No. 1 is 27 inches high, 16 inches deep and 8 inches wide. No. 2 is twice the width of No. 1, the other dimensions being the same. Between the outer steel casing and the water back within is a lining of either soapstone or fire brick, which has a covering also of mineral wool as an economizer of heat. It is fitted with their patent socket burner, which can be instantly removed for cleaning, and has an adjustable air mixer which they refer to as suitable for any gas. The heated water passes in at the top of the boiler, gradually forcing its way down. An advantage is claimed that in drawing water at the faucet it is not necessary to wait until the entire mass has been heated, it being possible to draw directly from the water back or that portion in the top of the boiler. The No. 1 is for 30 to 60 gallon boilers,



Water Back for Gas.

and consumes, they state, 30 cubic feet of gas per hour. No. 2 has just twice the capacity, and consumes double the quantity of gas. When the water is once heated the supply of gas can be reduced to 20 feet an hour.

In response to the call of President Daniel G. Finnerty of the National Association of Master Plumbers, the plumbers of Vermont met April 11, at Rutland, and organized a State association, which has affiliated with the Nation Association and will be represented in the convention at Detroit. The officers are: President, W. P. Jones, Rutland; treasurer, E. A. Valiquette, Rutland; secretary, E. H. Bagley, White River Junction.

Vanderman's Steel Tool Chest.

The Vanderman Plumbing & Heating Company, Willimantic, Conn., are putting on the market a tool chest made of steel which is intended to take the place of the ordinary tool chest used by plumbers, steam fitters and others. A general view of the chest is shown in the accompanying illustration. The material of the chest is $\frac{1}{16}$ inch sheet steel, with malleable iron corner pieces and hardwood braces, as shown, and is fitted with bolts to secure the cover, and furnished complete with hangers, lock, key and wood drawer. The manufacturers say that it cannot be broken or bent out of shape by any use to which a tool chest is put. The chests, which are finished with paint, are made in three sizes—11 x 12 x 24 inches, 14 x 15 x 30 inches and 16 x 17 x 36 inches, the weights being, respectively, 40, 60 and 75 pounds.

Vanderman's Steel Tool Chest.

TRAPS AND VENTS.

The Mechanics' Supply Company, 96 St. Peter street, Quebec, Canada, issue what they term "A Gentle Reminder." It is a folded card directing attention to their business and the goods they handle, which comprise gas, water, steam and plumbing supplies.

Barrett & Wallace are a new firm at Cohoes, N. Y., who will do tinning, plumbing, gas fitting and steam and hot water heating.

The uptown store of the J. L. Mott Iron Works, at 147 West Thirty-fifth street, New York, is largely used by plumbers to show the different styles of baths, closets and fixtures to their customers, owing to the fine display there made.

The Stewart Ceramic Company, 312 Pearl street, New York, are making some substantial improvements to their premises. Their office is now located on the first floor and their sample room has been enlarged to double its former size. This enables them to make a fine display of their solid white crockery washtubs and butler's pantry, corner, slop and kitchen sinks. They are also showing a bathtub of their manufacture which is one of their newest productions.

John Tucker of New York has opened a first-class plumbing establishment at 32 Bellevue avenue, Newport, R. I.

Disley & Weyland have purchased the large vacant lot on the south side of Jefferson street, Waterbury, Conn. The property has a frontage of 60 feet on Jefferson street, with a 10-foot driveway. They expect to build a three-story block for their plumbing and cornice business.

Hayward & Reynolds are a new plumbing firm at 335 Columbus avenue, New York. They were formerly with the Durham House Drainage Company.

Supplies for the steam fitter, gas fitter and plumber are the specialties of W. H. Hussey & Son, 150 West Thirty-fifth street, New York.

C. H. Pettit, 262 West Thirty-fifth street, New York, makes a specialty of plumbers' wood work. In addition to a variety of closet seats, bath rims and washtub covers he makes to order whatever may be required for special cases in any kind of wood.

At a recent meeting of the Master Plumbers' Association of Memphis, Tenn., resolutions of respect and sympathy were passed, and ordered sent to the family of J. W. X. Browne, an esteemed member who recently died.

Wm. H. Raley & Co. is the name of a new firm of plumbers and tinsmiths, located at 604 Washington street, Lynn, Mass.

John Apgar is erecting a store for R. Giles on Main street, Plainfield, N. J., where Mr. Giles will carry on the plumbing business.

Geo. R. Pasco, 274 Columbus avenue, New York, speaks highly of the smoke test as an aid to the sanitary engineer and plumber. He is now occupied in remodeling a number of plumbing systems whose defects were discovered by the smoke test.

The many friends of Thomas C. Knight of the Henry McShane Mfg. Company, 50 and 52 Myrtle avenue,

Brooklyn, N. Y., will be glad to learn that, notwithstanding the reports in the daily papers of his having been drowned in the storm last week, he is still dispensing plumbers' goods at the old stand.

C. H. MUCKENHIM of the South Lyon Mfg. Company of South Lyon, Mich., manufacturers of plumbers' wood work, in a recent visit to New York established an Eastern agency with Du Bois & Darrow, 61 Gold street, who are also Eastern agents for the Utopia Water Closets made by Park-McKay Company, Detroit, Mich.

J. A. FAIRBANKS & Co., the new plumbing firm, at Brewer, Maine, are doing the plumbing in the new addition that is being made to a building by A. C. Kavanaugh on Wilson street.

THE Board of Examiners of Plumbers of Watertown, Mass., at their last meeting examined five candidates, and all passed. They were W. J. Murphy, John C. Clark and M. T. Burke as master plumbers, and John W. A'Hearn and Herbert Goding as journeymen plumbers.

W. Z. EVANS, Delaware, Ohio, has sold his plumbing business to Pumphrey & Armstrong.

THE NATIONAL ASSOCIATION OF MASTER PLUMBERS, with present executive offices at 148 Boyleston street, Boston, Mass., Daniel G. Finnerty president, have issued in convenient form "A List of Manufacturers and Jobbers of Plumbers' Material Who are in Harmony with the National Association of Master Plumbers." The little book contains the names of a great many prominent supply houses and manufacturers of plumbers' goods in the United States. The names are arranged alphabetically, so it is an easy matter to refer to any individual firm. At the back of the pamphlet are printed the famous Baltimore resolutions with the amendments up to June 15, 1893.

THE BRAMHALL DEANE COMPANY, 262-266 Water street, New York, make a specialty of the manufacture of sterilizing apparatus, many of which are specially adapted for hospital use, and operated by either steam or gas and some by a lamp. They are devised for sterilizing the instruments used by surgeons and the bandages and dressings used in operations. Another apparatus is used for sterilizing or disinfecting the clothing of patients admitted to hospitals. The water sterilizer, which has been illustrated in our columns, is designed to furnish water for either drinking, cooking or surgical purposes. These goods open a new field for the plumber in his sanitary work, as the larger apparatus require either lead or iron pipe for their connections. The hospitals of Atlanta, Ga.; Elizabeth, N. J.; New Haven, Conn.; Boston, Mass., are equipped with these apparatus. The Kings County Hospital, at Flatbush, and the German, Presbyterian and Roosevelt Hospitals and the Eye and Ear Infirmary in New York are some of the other institutions in which these sterilizing apparatus have been used with satisfactory results.

IN RESPONSE to the advertisements of the Board of Education of Newark, N. J., for bids for the plumbing and steam heating repairs for the next year, two bids were received that have attracted some attention both in and out of the trade. One bidder offered to furnish journeymen at $2.20 and helpers at 50 cents per day, and another at $2.50 and 75 cents respectively. The ruling prices in Newark for good workmen are 60 cents an hour for plumber and helper, and 70 cents an hour for steam fitter and helper, and the discrepancy has excited some adverse criticism on the plumbers and steam fitters. The Master Plumbers' Association of Newark held a special meeting to consider the matter and a committee has been appointed to see the low bidders and get an explanation.

John Delehanty.

The students who have been through the plumbing course of the New York Trade Schools are all interested in John

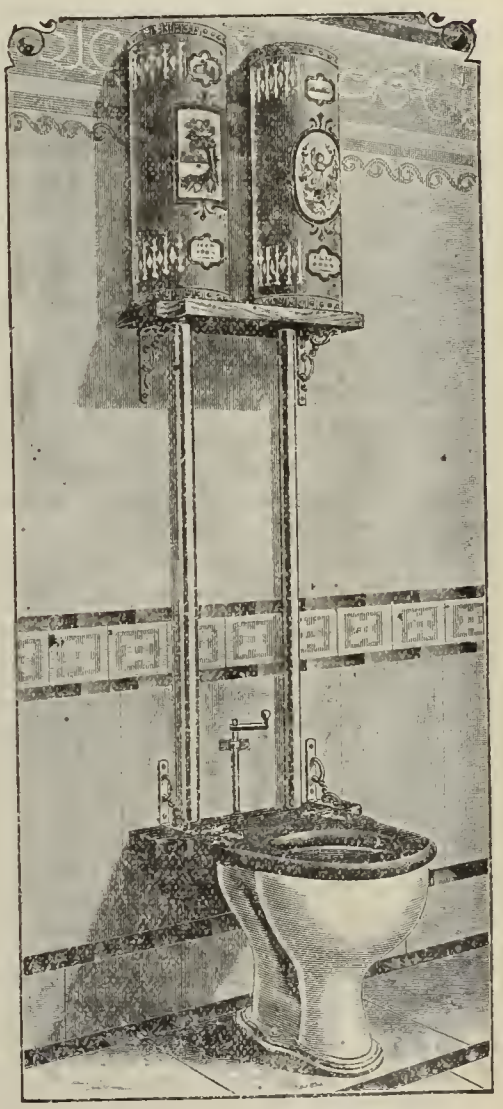


John Delehanty.

Delehanty, whose portrait is given here. Mr. Delehanty was born in 1860, and as a youth was bookkeeper in the plumbing establishment of I. O. Shumway until he left to serve a regular apprenticeship at the plumbing trade with another New York plumber, Wm. Foster. In 1890 he started an establishment, and is now interested in two shops under the firm name of Delehanty & Roach, one at 906 Columbus avenue, the other at 679 Second avenue. For the past two seasons he has held his present position, having been selected by the Trade School Committee of the Master Plumbers' Association of New York, of which association he is a member. In addition to the knowledge and skill he has acquired from experience, Mr. Delehanty has a fund of information gained from reading and studying plumbing literature and problems. Another invaluable qualification for his position is best explained by an observation of the wag of this year's class: "I have learned about all I want to know except whether or not Delehanty has a temper." Having had 144 pupils in the day class this year, 114 were graduated, and instruction given to two night classes of 79 and 74 respectively. In his work he was ably assisted by a well qualified corps of instructors. John McMenomy has been a plumber over 40 years and Rufus A. Clarke is another apprentice of the fifties. Thomas Kelly has given talks on modern plumbing before the journeymen's union. Thomas B. Walmsley, who learned his trade in England, has worked in South Africa, and for the past ten years in New York, was the instructor of the lead burning classes which made such a fine showing this year. George B. Woods and James J. Lynch are two other instructors, whose services were necessary on account of the size of the classes.

The Kelly Double Tank Water Closet.

The water closet which is herewith illustrated is the latest production of Thomas Kelly & Bros., 124 Franklin street, Chicago. The closet bowl used is of the syphon jet pattern. The two tanks and two valves are independent of each other, the valves being located below and at the rear of the seat. The operation of the closet is as follows: One of the air tight tanks fills with water while the other is empty, and by turning the handle shown above the seat, a valve is opened and the tank that is filled discharges its contents into the closet bowl. The operation of turning the crank opens the valve connected with the empty tank, which fills as far as the pressure of water can compress the air. The bowl contains a large quantity of water, which is forced out by the jet from tank. There are no movable parts in either tank or closet bowl, the only movable parts in connection with them being the valve pistons and the handle for operating them. Among the points of advantage claimed are the absence of noise and the impossibility of overflow; waste of water is also prevented. Either one or the other of the tanks acts as an air chamber at all times. There being such a large air chamber, the tendency is to prevent bursting of pipes and water hammer when used in a house of ordinary size. The claim is made that any objection that may be



The Kelly Double Tank Water Closet.

entertained regarding the use of syphon jet closets on account of the difficulty of giving open tanks sufficient elevation to produce the desired water pressure is overcome by the use of the double air tight tanks.

STOVE TRADE NOTES.

The Stove Convention.

Some changes have been inaugurated in connection with the annual convention of the National Association of Stove Manufacturers, to be held in Chicago next month, which it is expected will add materially to the interest and value of the meeting. Heretofore committees have had in charge the work of presenting reports or papers covering certain subjects relating to the business of stove manufacture, these papers being read at the sessions and discussion invited from the members present. The impression seems to have gained force in the minds of some of the members that greater good would result by slightly changing the method of procedure, and this year a new plan has been adopted. Invitations have been extended to various manufacturing concerns in the membership of the association to prepare papers on the subjects which were enumerated in our columns March 31, and in every instance we understand the invitation has been accepted. The topics announced cover a sufficiently wide range to draw out remarks from all present and evoke a lively discussion, which should tend to awaken increased interest in the proceedings of the national body. With a view to facilitating the business of the convention there will be no adjournment dividing the morning and afternoon sessions, but a short recess will be taken in the middle of the day, when a cold collation will be served in the assembly room. By this means members will be enabled to follow the progress of the discussion on any subject without serious interruption, and at the same time more satisfactory results will be accomplished. Judging from the circular lately issued by Secretary Thomas, the meeting should prove a most interesting and important one.

THE DIPPO MFG COMPANY of Cleveland and Chagrin Falls, Ohio, are making rapid progress in the manufacture of the Ferrosteel ranges, reference to which was made in these columns not long since. Mr. Dippo, who has been practically connected with stove making since boyhood, is very enthusiatic over the new mixture known as "Ferrosteel," which name has been adopted for both the metal and the productions of the company. The latest move upon the part of the company has been to secure W. M. Powell as vice-president and manager of the sales department, with headquarters in Cleveland. Mr. Powell is well known from his long connection with the management of the stove department of the James Smart Mfg. Company of Brockville, Canada.

Cupola Management.*—X.

BY DR. EDWARD KIRK.

Dumping.

As soon as the molders are through pouring their work, if there is no iron to be melted for other purposes, preparations are at once made for dumping the refuse from the cupola. The blast is first shut off by stopping the blower and the tuyere doors are at once opened to prevent the escape of gas from the cupola into the blast pipe, where it might do much harm. The melted iron in the cupola is then drawn off by the cupola men and poured in the pig bed. If there is a lot of small iron in the cupola that has not been melted time is given it to melt to save picking it out of the dump, but if there is a lot of pig or other heavy iron unmelted it is let fall with the dump and the bottom is dropped as soon as the melted iron is drawn off.

The small props supporting the bottom are first removed and laid away. The main prop is then removed by striking it with a long bar at the top or pulling with a hooked bar at the bottom, and the instant it falls the doors drop. When the doors of a large cupola drop, the sand bottom and a greater part of the refuse of melting falls with them and a sheet of flame and dust instantly shoots out ten feet or more from the bottom of the cupola in all directions. But the flame disappears in an instant and the dust settles, revealing the white hot dump in a heap under the cupola. The cupola men then throw a few buckets of water on it to chill the surface and deaden the heat, and the melter puts a long bar into the tuyeres and tries to dislodge any refuse that may be hanging to the lining while it is hot. Small cupolas do not dump so freely, and the sand bottom has frequently to be started with a bar after the door drops. A long bar must be used for this purpose and the melter must be on his guard, for the dump may fall as free as from a large cupola the instant it is started and a sheet of flame shoots out.

Small cupolas frequently bridge over above the tuyeres, and only the sand bottom and refuse below the bridge is dumped when the door falls. The aim of the melter is then to break away the bridge or get a hole through it, so the cupola will cool off in time to be made ready for the next heat. He puts a bar in at the tuyeres and breaks away small pieces at a time, and if there is not a large body of refuse in the cupola, a few short pieces of pig are thrown in from the charging door, so they will strike in the center and break through the bridge. This bridging and hanging up of the refuse in a cupola when only run for a few hours is entirely due to mismanagement, for any cupola, no matter how small it may be, can be run for six or eight hours without bridging and be dumped clean if properly worked.

When the dump falls from a cupola it is a semi fluid mass of iron, slag, cinder, dirt and fuel. This mass falls in a heap under the cupola, and if scattered or broken up when very hot it is more readily wet down and more easily removed when cold. In some foundries a heavy iron hook or frame is placed under the cupola before dumping and is withdrawn with a chain and windlass after the dump has fallen upon it and been partially cooled with water to harden it so the hook will not slip through it without breaking it up and scattering it. In other foundries it is scattered with a long rake or hook worked by hand. In pipe foundries two or three short lengths of condemned pipe are placed under the cupola before dumping, and the dump is broken up by running a bar into the pipe and lifting them up after the dump has been slightly cooled. But in a great many foundries where the dump is small or where there is plenty of room to remove it when cold it is let lie as it falls and is wet down by the cupola men, or a few buckets of water are thrown on by the cupola men to deaden it, and it is left for the watchman to wet down during the night. Care must be taken to not put on too much water or the floor under the cupola will be made so wet there will be danger of the dump exploding when it falls upon it the next heat.

Removing the Dump.

A number of plans have been devised for removing the dump from under the cupola. Iron cars or trucks have been constructed to run under the cupola and receive the dump as it falls, but they cannot be used unless there is sufficient room for the doors to swing clear of the car, and few cupolas are so constructed. The dump must be removed from the car when hot to avoid heating and injuring the car, and considerable room is required for handling the car after it is taken from under the cupola. For these reasons cars are seldom used. Iron crates have been made to set under the cupola and receive the dump and be swung out with the crane, but they get fast under the cupola and soon are broken, and it is almost as much work to handle the dump from the crate as it is from under the cupola. A number of other plans have been tried, but the dump must be picked over by hand, and it is as cheap to pick it over at the cupola and remove it in wheelbarrows as any way that has yet been devised. The dump is broken up with sledge and bar when cold and picked over. The large pieces of iron are picked out and thrown in a pile for remelting. The coke is thrown in a pile to be taken to the scaffold or core oven furnace. Anthracite coal that has passed through a cupola and been subjected to a high heat will not burn alone in a stove or core oven furnace, and it is very doubtful if it produces any heat when mixed with other coal and again put in the cupola, and only the large pieces are picked out, if any.

The cinder, slag and other refuse are shoveled into a wheelbarrow and taken to the rattle barrels or dump. If the sand bottom is to be used over again it is riddled out in a pile and wetted.

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If not, it is removed with the cinder and slag. As soon as the bulk of the dump is removed the melter goes into the cupola and breaks down the ring of cinder over the tuyeres and chips off any that may be adhering to other parts of the lining. The dump is then all removed and the floor around the cupola is cleaned up preparatory to daubing up. Nothing is done with the dump after it is taken from the cupola but to recover the iron from it. This is done in two ways, by picking it over or milling it. The iron is often of the same color as the dump, and so mixed with it that it is almost impossible to recover it all by picking unless a great deal of time and pains is taken; and it is cheaper to throw out only the pieces of pig and shovel all the remainder into the tumbling barrels, where it is separated in a short time and all the iron recovered that is worth recovering.

Chipping Out.

Before going into the cupola to chip it out the melter slushes one or two buckets of water around the lining from the charging door to lay the dust. He then goes in from the bottom if he can get in, but if the cupola is so badly bridged he cannot get up into it he takes a long bar and endeavors to break down the bridge from the charging door, or goes down into it from the charging door, and with a heavy bar or sledge breaks it down. As soon as he gets a hole through large enough to work in he goes down through it and with a sledge or heavy pick breaks down the shelf of slag and cinder that always projects from the lining over the tuyeres. He then takes a sharp pick and trims off all projecting lumps of cinder and slag and gives the lining the proper shape for daubing up. It is not necessary or advisable to chip off all the cinder and inherent matter down to the brick, for the cinder stands the heat equally as well as new daubing, and in some cases better. But all soft honeycombed cinder should be chipped off and all projections of hard cinder that are likely to interfere with the melting or tend to cause bridging should be removed.

Some melters have a theory that to prevent iron running into the tuyeres they must have a projection or hump on the lining over the tuyeres, and they let the cinder build out from 3 to 6 inches thick and 6 to 12 inches deep at the base. These humps tend rather to throw iron into the tuyere than to keep it out, for the fuel becomes dead under the hump and the iron in its descent strikes the hump and follows it around into the tuyere. They also form a nucleus for bridging. The refuse of melting as it settles lodges upon these humps and is chilled by the blast. A small cupola with these humps over the tuyeres will not work free for more than an hour, while the same cupola with the humps removed and the lining straight would work free for two hours and dump clean. They also interfere with the melting and cause bridging in large cupolas All humps that form on the lining above the melting point from bad charging or other causes should be removed, for they hang up the stock and retard melting.

The cupola picks generally used are entirely too light for the work to be done with them and the handles are not firm enough. When the melter strikes a blow he cannot give the pick force enough to cut away the point desired and the handle gives in the eye so the pick glances off and cannot be held to the work. Repeated blows with a light pick turn the edge and renders the pick worthless and the melter has to do two or three times the work really necessary in chipping out the cupola, and then he does not get it right. What the melter wants is a heavy pick with a firm handle. Then he can hold the pick where he strikes and prevent it glancing off. He can strike a blow that will cut away the cinder at one stroke and not jar and injure the lining nearly as much as he would by repeated blows with a light dull pick. The melter should be provided with three picks made of the best steel, weighing 4, 6 and 8 pounds each. They should be furnished with iron handles solidly riveted in, or should be made with large eyes for strong wood handles. The picks should be dressed, tempered and ground as often as they get the least bit dull.

Columbian-Garland Range.

The Michigan Stove Company of Detroit, Chicago, Buffalo and New York City have just issued a fine catalogue of their new line of wrought steel ranges brought out under the name of Columbian-Garland. The catalogue is a handsome specimen of the engraver's art and the printer's skill. It is 8 x 10 inches in size, and only contains 16 pages and is bound in a paper cover, but on these comparatively few pages has evidently been concentrated an unusual amount of book making taste and experience. The cover is illuminated with richly embossed gold lettering. A silken cord ties the leaves together. The body of the ink used in the book is black, but it is relieved by an occasional crimson line, which is by no means out of place, but very tasteful. The engravings are half tones of remarkable sharpness, which bring out the special features of the range with excellent effect.

The Columbian-Garland range is described in this catalogue as of moderate price, but strong, durable and desirable in every way, and possessing all the advantages of higher priced goods. Three styles of grates are furnished—the duplex for hard coal, a very heavy flat shaking and dumping grate for soft coal, and a special wood grate. All these grates and their frames pull out and can be instantly changed or replaced without disturbing the bed plate or fire box linings. The ash pan is unusually large, and guards are provided which throw all the ashes into the pan. The draft is not only admitted through the ash pit door in front, but also through slides at the end of the range to the full length of the fire box. The oven is "aërated" like the ovens of other Garland cooking stoves and ranges. The entire oven can be drawn out by simply turning four buttons, thus giving access to all flues. The oven door is of steel, smooth on the inside, and when open it answers for a shelf, being counterbalanced with a weight and spring. A pedal attachment can be used both to open and shut the door. The top of the range is made up of pans or key plates, having two kettle holes in each. The front pan has a loose center, which is practically indestructible. Two or more ranges of this line can be placed together and connected to make a continuous range, with one fire box for each oven.

The illustrations show first the Columbian-Garland range, with low closet and in square form, made in six sizes; next, with high shelf and low closet, in six sizes; third, with high shelf, low closet and a 15-gallon copper reservoir on brackets at the side, also in six sizes; fourth, with high shelf, low closet and broiler on brackets at the side, also in six sizes; fifth, with high and low closet and square form, in six sizes; sixth, with high shelf, low closet, and connected with hot water boiler; seventh, with double oven, high shelf and low closets.

ODD PLATES.

The Harvey Furnace Company, at 1325 Broadway, New York, make their Vim furnaces and ranges a specialty and find a regular demand for heating with hot air.

The F. E. Belden Mica Mining Company, 12 Broad street, Boston, Mass., are putting on the market New Hampshire mica, for which they claim particular clearness and fine rift. It is put up in pound packages in convenient form for the stove trade.

The Thatcher Furnace Company, 33 Peck Slip street, New York, manufacturers of the Thatcher and Scorcher furnaces and the Champion steam and hot water apparatus, are making some necessary changes in their manufacturing plant at Newark, N. J. They are putting up a substantial and capacious brick building for storing their patterns and are making a large four-story addition to their foundry building.

The Rocket, Columbus and Servia ranges, made by Southard, Robertson & Co., Peck slip and Water street, New York, are now conspicuously displayed for the consideration of the buyers of summer goods. A novel sign is displayed over their new Waldorf range. Letters spelling the word have been sawed out of 1-inch white pine and mounted on black walnut and varnished.

The New York office at 244 Water street of the Raymond & Campbell Mfg. Company, Middletown, Pa., is preparing for the summer trade in ranges by receiving two carloads of Anna, Capital, Model, Perfect and Grand Perfect ranges.

J. Snyder of the Thomas, Roberts, Stevenson Company, Philadelphia, spent the week at their New York house at 250 Water street, in the interest of the Gauze Door and Fortune line of stoves and ranges.

The Warren Hardware Company of Warren, Ohio. propose to erect a plant for the manufacture of steel ranges. They announce that under no circumstances will they accept from the citizens of Warren any contributions or bonus to influence the location of the plant. Some movement of that kind was started because of the rumor that other towns were bidding for the new works.

The works of the Electric Oil Stove Company, Homer, Mich., are the subject of an illustrated notice in a late issue of the Homer *Index*, published every Wednesday at the place named. From this article we learn that the proprietor and general manager of the works, Benjamin R. Goodrich, went to Homer about 19 years ago with a capital of less than $1000 and embarked in the hardware business. Gaining more than an average degree of success, he retired in 1885, accepting a position as traveling salesman for the Detroit White Lead Works, continuing with the company for about two years. In 1888 he commenced business as a manufacturer,

having invented a self heating folding bathtub with automatic connecting waste tube. In 1890 he invented an oil heating stove, and disposing of his bathtub rights, turned his attention to the manufacture of oil stoves. The works of his company are well equipped with the necessary machinery for carrying on the business, but it is the intention to soon install a new engine of more than double the horse power of the present one. One of the buildings is devoted to the grinding, polishing and nickel plating departments, another to the mounting and crating rooms, tin shop, &c., while a third is occupied as a testing room and paint shop. The office occupies a one-story building, which is separated from the others. According to the article referred to there were in the first year of the company's existence upward of 7000 heating stoves manufactured and sold, while in 1890 the output was 11,000 heaters and 6000 ranges, and in 1892 there were 13,000 heaters and 14,000 ranges and lamp stoves turned out. The works give employment to a force of hands ranging from 20 to 80, according to requirements. R. E. Goodrich assists in the general management; A. E. Knight has charge of the shipping department; Charles Gardner is inspector of castings, and James Merrett is foreman of the shops.

THE DANVILLE STOVE & MFG. COMPANY of Danville, Pa., will bring out this season, under the name Ideal, a line of square heaters, comprising four sizes, handsomely nickeled and ornamented, and designed to meet the demand for high class medium priced goods Their line of ranges will be augmented by the addition of the Beaver, a new six hole construction of moderate price, with solid or portable hearth, hopper or pouch feed, adapted to all kinds of fuel, duplex or triplex grate, with or without shelf, handsome nickel bracket and band, and large ash pit. The new range will also be made embodying a patented device for heating an upper room. The company are also improving the line of Beaver furnaces and redressing their line of Queen Beaver ranges. They report a satisfactory business for last season, notwithstanding the dull times, and the close of the season found them with very little stock on hand. They are this season, in addition to their own lines, pushing sales of Monarch gasoline goods, for which they are agents for New England, New York, New Jersey and Pennsylvania.

THE FULLER & WARREN COMPANY, Troy, N. Y., issue advertising cards calling attention to the fact thst house heating with hot air furnaces and hot water boilers is at present attracting considerable attention and add that their F. & W. Co. furnaces produce excellent results. They invite the trade to send for their illustrated catalogue.

J. H. CORT & SONS, Beekman and Water streets, New York, are fitting the kitchens of the St. Lawrence apartment house, at Eighty-eighth street and Madison avenue, with gas ranges. Their Cort gas range, with high shelf and canopy, is the only cooking apparatus used. Hot water is furnished from an apparatus in the basement. Their ranges have been used in the Carrollton, Pontiac and Palacio apartment houses with general satisfaction.

WE ARE INDEBTED to the Magee Furnace Company of Boston, Mass., for a neat little folder announcing that within the past three months the patterns for the Boston heater have all been made over and many valuable improvements introduced. It is also stated that the company are using heavier plate iron in the construction than ever before. The Magee Boston is well known from Maine to California, and in the little folder which the company have issued are set forth some of the claims made for it. We also have from the company a circular recently issued by E P. Carpeuter Company of Pawtucket, R. I., which is in the nature of an advertisement of the Magee Grand range. This stove hss proven exceedingly popular with the trade in the territory covered by Messrs. Carpenter, and during the fall sesson of 1893 they sold 173 Magee Grand ranges, a record which it is claimed was never before made in the same time by any dealer in New England. The circular gives a list of the names and addresses of the purchasers. This shows what enterprise and push can accomplish in the sale of goods possessing superior features of construction and operation.

THE LITTLEFIELD STOVE COMPANY of Albany, N. Y., send us a copy of a pamphlet which contains some new matter relative to the West Shore range. It is entitled: "Fifty-nine Years' Experience from the James or Saddlebag Stove to the West Shore Range for 1894" The opening pages describe the important inventions incorporated in the West Shore range, following which are particulars gleaned from the records of the Patent Office and designed to show the difference between the West Shore and other ranges. A feature of the pamphlet is the directions for setting up and starting a fire in the West Shore range and the size of coal which should be used. The pamphlet is profusely illustrated and shows the range named in numerous styles and sizes. Mr. Littlefield states that the pamphlet contains "the truth, the whole truth and nothing but the truth; therefore it will be of value to studious readers."

THE PENINSULAR STOVE COMPANY of Detroit, Mich., are distributing some very pretty decorated cards of a size to be easily carried in the pocket, and which are intended for advertising the Peninsular stoves and ranges. The cards constitute the first installment of the company's stock of advertising matter which is being prepared for dealers handling Peninsular goods. The side of the card carrying the ornamental design has in the upper right hand corner a chocolate colored panel containing six words, as follows: "Quick bakers; superior cookers; powerful heaters." In the lower left hand corner is a *facsimile* of the company's trade-mark.

WILLIAM KERBY, 4 and 6 Peck slip, the New York representative of I. A. Sheppard & Co., Philadelphia, is showing a seasonable attachment to the Royal Fidelity range. It is a cross piece to which two gas burners are attached which takes the place of the regular cross piece and supplies a flame under both of the cooking holes of the fire chamber. A cock for each burner is provided and an attachment for connecting a hose to supply the gas. It can be applied and used by any one. Those ranges which have an upper warming shelf can be supplied with gas burners attached to the shelves.

GAS AND GASOLINE STOVES and summer ranges, under the name Manhattan, are now attractively displayed by Eugene Munsell & Co., 218 Water street, New York. They also make a specialty of supplying mica for all purposes, and to meet the requirements of stove manufacturers they are prepared to furnish first-class mica in any desired size and quantity. For the smaller dealers packages of various quantities, containing an assortment of convenient sizes, are prepared.

HANSELL & BELSON have leased the showroom and warehouse at 144 North Second street, Philadelphia, and will enter into the wholesale stove business, representing Chas. Noble & Co. in the vicinity of Philadelphia. They will also represent some leading refrigerator, gasoline, oil and gas stove manufacturers, and will carry a full line of supplies for the stove trade.

A. B. FISHER, 387 Kent avenue, Brooklyn, N. Y., is just completing patterns for an entirely new gas regulator or air mixer for gas stoves. Mr. Fisher makes an extensive line of gas stove faucets and air mixers.

REPORTS from Chattanooga, Tenn., are to the effect that the capacity of the works of the Southern Queen Range Company, located in that place, is to be doubled.

THE WILCOX HEAT-LIGHT COMPANY, Grand Rapids, Mich., have issued from the press a 16 page pamphlet, bound in straw colored covers, and relating to the line of oil heating stoves which they manufacture. The assortment includes the Model oil heater, made in several sizes, the Challenge, the Eclipse and the Standard. The company state that for this season they have added several new styles and have made a number of important improvements. The Model gas radiator is one of their specialties and possesses features which render it powerful in operation. A point to which attention is invited is the presence of a water pan under the burner. The water fount is made of heavy cast iron, enameled, and is claimed to be peculiar to this radiator.

AT A MEETING of the Warren Hardware Company, held Saturday, April 7, it was decided to commence work on the new buildings as soon as possible. The main structure will be about 40 x 150 feet in size, and it is expected to have the plant in running order the latter part of May. When the new works are completed the company will employ from 25 to 50 men and will turn out about 20 ranges a day.

HART & CROUSE of Utica, N. Y., have leased the store 79 Lake street, Chicago, Ill., where they will carry a full line of Royal heaters for hot water, steam, hot air and combination. The firm will take possession of their new quarters on May 1 and the management will be in the hands of George L. Rood, who will at all times be ready to show the goods and furnish estimates for heating.

THE FOX FURNACE COMPANY, 28 Vincent street, Cleveland, Ohio, have issued an attractive catalogue relating to warm air furnaces. It consists of 30 pages of letterpress bound in colored paper colors, and presents a great deal of information and value to dealers handling goods of the character named. The opening pages show how the joints in the Fox furnaces are made to render them perfectly tight and also illustrate and describe the grate, dust flue and fire pot which the company use. The Fox furnace is offered in a variety of styles and sizes, tables being given showing prices and dimensions. A list of testimonial letters from various in-

dividuals and concerns indicate in some measure the satisfaction which the heaters have given to users of them.

THE CHICAGO & ERIE STOVE COMPANY favor us with an illustrated circular of the Erie gasoline stove which they have just placed upon the market. The stove is made in several sizes, is simple in the arrangement of its parts, and is provided with a single generator. The burners are sawed on the side, rendering them, the makers claim, very economical, because they spread the flames into thin sheets, securing a large amount of heat in proportion to the quantity of fuel consumed. The cast top is of ample proportions, with a space between the burners. The independent burner is made on the same general plan as those described in connection with the single generator. Nos. 20 and 120 are made with a single generator for two burners, while Nos. 30 and 130 have three burners. The No. 1 Erie has one independent generator; Nos. 2 and 12 have two independent generators, and Nos. 3 and 13 have three independent generators. The manufacturers state that the tank has an inside arrangement to expel the air from the pipes when first lighted, making a quick flow of gasoline to the burners.

F. & L. KAHN & BROS., Hamilton, Ohio, send us circulars illustrating and describing the I X L Family Peerless gas stoves, which embody many interesting features. The roaster and broiler are situated below the top and are of sufficient capacity to meet all ordinary requirements. Baking is done in the oven above the top, the oven having a drop door which makes a shelf when opened. The burners have removable covers and adjustable air mixers. These goods are shown in several varieties, as are also the I X L table stoves with one, two and three burners. A second circular relates to the Waldorf broiler and roaster for any kind of gas. This is claimed to be the latest and most efficient broiler and roaster for hotels, restaurants and large families. The doors when opened stand flush against the right and left ends of the broiler and out of the way. Attention is also invited to the Bijou Junior, a four-burner all cast hot plate, and to the Corker, shown with one, two and three burners.

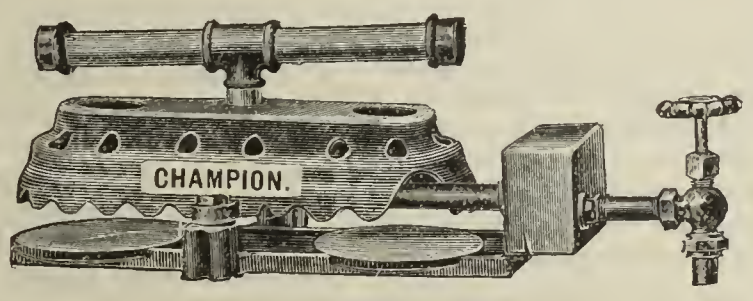
E. C. HANRAHAN has been appointed Western manager of the Peninsular Stove Company, in immediate charge of the company's branch house at 79 and 81 Wabash avenue, Chicago. Mr. Hanrahan has been connected with the company for about a year. He was previously located at St. Louis, where he conducted a stove jobbing business. Mr. Hanrahan is well acquainted with the Western stove trade and is thoroughly conversant with all the details of the stove business.

A FOUR-PAGE CIRCULAR which is received bears the inscription: "A Few References from Parties Using Richardson & Boynton Company's Warm Air Furnaces Erected by the Canfield Stove Company, 166 Strand and 19 Ferry street, Rondout, N. Y." The testimonial letters are from various sections of New York State, and indicate in a very forcible manner the estimation in which the goods named are held by those who have practically demonstrated their merits.

WILLIAM J. H. GLUCK of Baltimore, Md., is sending out a little pamphlet illustrating the Reliance and Reliance Safety gasoline stoves, which are made in several styles and sizes. These goods are finely japanned and ornamented, and are provided with safety Reliance tanks. The burners are the Reliance individual burner No. 2, operated with nickeled wheel blunt valves, so that the flames can be turned down low.

Champion Oil Burner.

In the accompanying illustration we present a general view of the Champion oil burner, which is being offered the trade by the National Oil Burner Company of Cleveland, Ohio. The burner and valves, which represent the result of years of experimentation, are covered by United States patents granted last year. In operation it is simply necessary to place the burner on the grate of the cook stove or range in connection with which it is employed, drill a ⅝-inch hole in the stove door, or put on a sheet iron door, and connect the pipe and valve to the burner. The oil tank may be placed on a bracket against the wall near the stove, or it may be placed outside of the house, as most convenient. The burner for use in connection with heating stoves is placed in position in the same general manner as described above. The manufacturers claim the burner will not smoke or carbonize and can be used without odor or noise. It is made strong and durable, and the company say they will replace any burners showing flaws or defects within one year. They use a special rolled lead pipe for the purpose of conveying the oil from the tank to the burner. The oil tank is made of heavy galvanized iron.



Champion Oil Burner

Camden, N. J., is to have gas at $1.25 per 1000. The gas company having improved their plant, continue their enterprise by offering their gas at a much reduced rate.

Advices from Springfield, Mass., state that 300 of the new Krag-Jorgensen rifles have been completed and are about to be sent to the War Department. Samples of the new gun have been sent to the Governors of the different States, and one of the new guns was sent on Tuesday to the German Emperor. Samples are also to be sent to the officers of the departments in the United States Army. The Fourth United States Infantry will be the first regiment equipped with the new piece.

The Central New Jersey Traction Company have been incorporated at Trenton, N. J., to carry out a scheme for connecting New York and Philadelphia by trolley. A supplementary charter is being obtained in Pennsylvania for a line from Philadelphia to Trenton. Construction of the trolley lines between Paterson and Orange and Trenton and Kingston is, it is stated, to be begun at an early date.

SCRAP.

IMPORTS of tin and terne plates into the United States during the first eight months of the present fiscal year were of the value of $7,883,304. In the corresponding period ended February 28, 1893, the value of tin plates imported was $10,304,543.

MARSHALL BROS. & Co. of Philadelphia report a fair volume of business for the past month. They are exceedingly busy in their black plate department, consequent upon the increased demand for American tin plate.

HENRY W. SCATTERGOOD, proprietor of the Black Diamond Tin Plate Works, Laurel street, Philadelphia, reports an improvement in the demand for his products. His brands are the Black Diamond, an extra coated roofing plate; Quaker City, Horse Shoe, Arrow and Laurel.

HUGHES & PATTERSON of Philadelphia have closed down their tinning plant, having a stock of plates on hand sufficient for the present requirements of their trade.

GOV. ROBERT E. PATTISON of Pennsylvania was a visitor in New Castle, Pa., last week, and while there visited a number of industrial establishments. The Governor seemed to be particularly impressed with what he saw at the plant of the New Castle Steel & Tin Plate Company. In this establishment he witnessed the operation of making tin and terne plate from the billet to the finished plate, or more properly speaking, from the ore to the finished plate, as the billets are obtained from the Shenango Valley Steel Company, whose plant is located adjacent to that of the New Castle Steel & Tin Plate Company. The pig iron used by the Shenango Valley Steel Company is made by themselves, so that it can be truthfully said that the Governor saw tin and terne plate made from the ore to the finished material.

THE REPORT of Gummey, Spering & Co., Philadelphia, Pa., to Special Agent Ira Ayer of the Treasury Department, respecting their output of tin plates for the quarter ending March 31, 1894, gives the following figures:

Total make tin and terne	1,116,330
Tin plates	214,296
Terne plates	902,034
American black plates	898,431
Foreign plates	217,899
Tin under 63 lbs. per 100 square feet	213,453
Terne plate all under 63 lbs.	

The firm of Gummey, Spering & Co. began making plates early in 1892, and have not stopped except a few days for repairs since then. A particularly gratifying fact in the above report is the great amount of American black plates, more than three-quarters of the total product being of American origin and only 218,000 pounds of foreign plates.

TRADE REPORT.

The Iron Market.

The intimations of an improving market made last week appear to have been confirmed by recent developments. A considerable amount of business has been placed, and there are very few furnaces or mills that have not made substantial additions to their order books. There is also quite a good deal of business under negotiation, and while prices show little or no improvement, the sentiment is more hopeful than it has been for many weeks past. The increase in the output of Pig Iron concurrently with a decrease in stocks is a significant feature, and is not without influence on those who closely watch the course of events. No great advance is looked for, but it is expected that the next two or three weeks will show that the corner has been turned, and the building up process fairly commenced.

Pig Iron.—As yet no intimations have come to sales agents of Southern furnaces in the New York district to withdraw from the market as the result of the troubles in the Birmingham coal mines. On the contrary, prices lower than ever have been made during the last week. Sales of Western Pennsylvania Irons are being pushed in this territory, and it is reported that they are going right into the foundries in the Lehigh Valley. One point which is attracting some attention among sellers is the rapid decline during the past year in the proportion of No. 1 Iron which founders are using in their mixtures. Some of them have learned to get along without it altogether. We quote standard brands $12.50 @ $13.25 for No. 1; $11.50 @ $12.25 for No. 2, at tidewater. Southern Iron, same delivery, $12 @ $12.50 for No. 1; $11 @ $11.50 for No. 2; $10.50 @ $11 for No. 3; $10.75 @ $11.25 for No. 2 Soft, and $11.25 @ $11.50 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $10.25 @ $10.50.

In the Philadelphia district a better demand for Pig Iron is reported, and for nearly all grades of the metal, but prices are quite irregular. The only way to get an exact quotation is to name brand, quantity, delivery and terms of settlement, and as these vary, prices vary. The quotations given below fairly indicate the range of quotations in Philadelphia and vicinity, although at Harrisburg, York and Susquehanna Valley points 25¢ @ 40¢ less has been accepted owing to advantages in freights, &c., but even then there is frequently a wide disparity in quotations. Southern Irons are selling at about $11.75 for No. 2 X, and No. 1 X at $12.50, while Pennsylvania brands are supposed to bring somewhat higher figures. The feeling in regard to prices is a little mixed, but it is conceded that consumers are taking hold more freely, and to that extent the situation is improving. General quotations for Philadelphia and equivalent points are about as follows:

Standard No. 1 Foundry X	$12 50	@	$11.85
Standard No. 2 Foundry X	11.75	@	12 25
No. 2 Plain	10.75	@	11.00
No. 1 Soft	11.00	@	11.50
No. 2 Soft	10.50	@	10 75

A large number of sales of Bessemer Pig have been made during the month in the Pittsburgh district to Eastern mills, while a considerable tonnage for speculative purposes has also been closed, the whole aggregating some 100,000 tons. There is no change in the situation of Foundry Iron, which continues in light demand with prices ruling very low. Quotations are given as follows:

No. 1 Foundry	$11.00	@	$11.25,	cash.
No. 2 Foundry	10.25	@	10.50	"
No. 3 Foundry	9.75	@	10.00	"
Bessemer	10.35	@	10.50	"

Transactions in the Chicago market in both local and Southern Coke have been almost wholly confined to small lots. The most important sale last week was one of about 2000 tons of local Iron. The demand for small lots comes from all classes of customers, but the aggregate volume of such business is by no means satisfactory to furnace companies. Consumers are still apprehensive of disturbing influences which may again unfavorably affect prices, and consequently inquiries are unusually light. Very little is doing in Lake Superior Charcoal. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00	@	$15.50
Local Coke Foundry, No. 1	11.25	@	11.50
Local Coke Foundry, No. 2	10.50	@	11.00
Local Coke Foundry, No. 3	10.00	@	10 50
Local Scotch	11.50	@	11.75
Ohio Strong Softeners No. 1	13.00	@	14.00
Southern Silvery, No. 1		@	11.50
Southern Silvery, No. 2		@	11.00
Southern Coke, No. 2	10.00	@	10.35
Southern Coke, No. 3	9.75	@	10.00
Southern, No. 1, Soft	10.25	@	10.50
Southern, No. 2, Soft	9.75	@	10.00
Tennessee Charcoal, No. 1	15.00	@	15.50
Tennessee Charcoal, No. 2	14 50	@	15.00
Alabama Car Wheel	17.85	@	18.00
Jackson County Silvery	15.00	@	16.00
Other Ohio Silvery	13.00	@	13.50

Advices from Southern markets indicate that there has been a fair volume of business in Coke Pig Iron during the week, but not much movement in other kinds. Prices as a rule have been well sustained by the furnaces, which have sold mainly at delivered prices and therefore buyers in many instances have secured supplies at a lower cost to themselves. The strike or threatened strike among the laborers in the South makes sellers cautious, although it is thought that the difficulties will be adjusted without any great amount of friction. The sales for spot and forward delivery aggregate for the week upward of 15,000 tons and sales have been contracted for the remainder of the year at the same prices as are accepted for spot delivery. The buyers of Iron are mainly stove and agricultural works. The Iron Pipe works are melting considerable Iron but are not purchasing much. The market, as a whole, while not essentially better, is certainly no worse than it has been. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$10.50	@	$10.75
Southern Coke, No. 2	9.25	@	9.50
Southern Coke, No. 3	8.75	@	9.00
Ohio Soft Stone Coal, No. 1	14.50	@	15.50
Ohio Soft Stone Coal, No. 2	14.25	@	14.50
Lake Superior Coke, No. 1	13.00	@	13.50
Lake Superior Coke, No. 2	12.00	@	12.25
Hanging Rock Charcoal, No. 1	17.00	@	17.50
Hanging Rock Charcoal, No. 2	16.50	@	17.00
Tennessee Charcoal, No. 1	13.00	@	13.50
Tennessee Charcoal, No. 2	12.00	@	12 50
Standard Southern Car Wheel	16.25	@	17.00
Lake Superior Car Wheel and Malleable	16.50	@	17.00

Metal Market.

Pig Tin.—From the prices that ruled at the date of last week's report there has been an advance of about 0.25¢ ℔ lb, 19.75¢ having been realized for 5-ton lots of Straits Tin for delivery before the end of the current month. The rise was due chiefly to strong advices from London on the 16th inst., but facilitated by the fact that the stock in New York is not only moderate but the holdings so scattered that the market is extremely sensitive to London manipulations. Subsequently values here went a fraction lower, for no other visible cause than a reaction in the foreign market, sales being made late in the week at 19.60¢ for spot and 19.55¢ @ 19 60¢ for April delivery. There is little speculation here at present, and hardly any tendency in that direction. The shape of the market is not attractive. Straits shipments during the first half of the month were quite heavy, including 800 tons to Great Britain and America and 475 tons to the Continent, against a total of 775 tons in the corresponding period last year. Consumption is rather below the average for this season of the year. Prices for small parcels are unchanged at a basis of 21¢ @ 21¼¢ ℔ lb.

Copper.—Business on home account has been larger during the past week. Liberal contracts were made with consumers at 9½¢ for Lake Ingot, deliveries running up to July. Supplies of Montana product have been cut off to some extent by the Great Northern Railroad strike,

but Arizona product has come forward in sufficient quantity to meet the demand and orders for the cheaper varieties of Copper are being filled at old prices, say 9¼¢ @ 9⅜¢ for Electrolytic and 9¢ @ 9¼¢ for ordinary casting brands. The volume of sales to consumers has been moderate. These latter are buying on an exceedingly prudent scale, taking only just as much as they actually need for present use. Retail prices are about at the level of the last few weeks, Lake Ingot ruling at 10⅓¢ ℔ lb for small lots from store.

Sheet Copper.—The demand for this material has not expanded to any appreciable extent, nor will it be likely to increase until there is more evidence of a resumption of activity in the building trades. Prices, however, hold their own.

Pig Lead.—The market has been very steady at the higher range of prices established last week. Nearly, or quite, 1000 tons have been placed in round lots, at or about 3.45¢, by local brokers, and a number of single carloads were sold at 3.47½¢. Meanwhile, there was some effort to force prices lower, chiefly by one or two local firms, but the effort was fruitless, since other than Eastern buyers not only purchased quite freely, but had brokers on the alert for all Lead offered at less than 3 45¢ for delivery this month or next. The buying during the week has been chiefly for jobbers and consumers. Very few purchases were made for speculative account. Still jobbers report business as being of a tame character, and not up to the standard of a week or two ago. Indeed, the demand during the present month has not borne out the promise of March, when a very fair movement developed after the long months of depression.

Lead Pipe and Sheet.—Orders and inquiries for Lead Pipe and Sheet Lead have fallen off somewhat from the slightly better volume developed in the first part of the month, doubtless due to the return of cold and stormy weather. A better movement is hoped for so soon as settled weather approaches and buildings now in hand are pushed to completion. Stocks in consumers' hands are very light, but purchases do not, as a general rule, extend beyond absolute requirements for present use. Prices are fairly well maintained and collections are reported as good.

Spelter.—There are some signs of a steadier turn to the market. The best evidence of this is that no response is made to requests for firm offers of the poorest Western brands at 3.55¢, delivered here or at common point. The tests made indicate that 3.60¢ is the very bottom price, and that sellers at less than 3.65¢ are the exception. No large transactions have been effected here, but sales of moderate sized lots to galvanizers make a better showing than for some time past. Small quantities of Western from store are quoted by jobbers at about 4¢ @ 4¼¢ ℔ lb. About 50 % of the producing capacity of the country is shut down. Several furnaces have ceased operations since our last report, so that there is every reason to expect that values will not go much, if at all, lower.

Sheet Zinc.—The consumptive demand is of a very perfunctory character. Manufacturers have again put down the price of Sheet Zinc 2 % during the past week, and it is now far below any previously quoted value. Jobbers' price for 600 lb casks is 4½¢; small lots selling from store at 5¢ @ 5¼¢ ℔ lb.

Antimony.—Fair sales have been made and the market is quite steady at about 8¾¢ @ 8⅞¢ for Hallett's, 10¢ @ 10¼¢ for Cookson's, and corresponding prices for minor brands, with a premium of about ¼¢ on small quantities.

Nickel.—Little change has taken place, purchases being of routine character and fair, all told. Prices range between 40¢ and 45¢, as to size of lot.

Tin Plate.—So far as regards wholesale buying, little if any improvement has been experienced during the week in sales for either prompt or future delivery. Considering the season of the year this market is exceptionally quiet and business below expectations. The majority of canners appear to have secured sufficient material by contracts for future delivery entered into at the beginning of the year, while the remainder may be hanging on until the last moment before placing their orders. Be this as it may, the demand from this class of consumers has been remarkably tame of late. Jobbers report, however, that small orders fot spot goods have been sufficient to keep them very fairly busy, although these are almost entirely of the hand to mouth character that has become chronic of late, and their aggregate is hardly up to the spring season average. Roofing Plates show some more animation with the return of the building season. Prices are still uneven and more or less irregular, despite the fact that stocks here are considerably below the average and that foreign manufacturers are seriously considering a further reduction of output to offset the bearing of slow sales. Importations for this year have been comparatively light, while foreign stocks are becoming heavy. This is partly explained by the fact that some importers find it cheaper to carry their stocks in store on the other side than to hold them in bond in this country.

A special cable dispatch to *The Iron Age* dated London, April 18, reports the British Tin Plate market as follows: Tin Plate business has been of very fair volume, but the market shows soft tone. At the quarterly meetings prices ruled in buyer's favor. Fair orders were placed for 10 x 10 Siemens Cokes at 3 pence decline, and for Squares at 3½ pence under market quotations. Liverpool quotations for Plates were as follows:

IC Charcoal, Alloway grade	12/ @ 12/6
IC Bessemer Steel, Coke finish	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/3 @ 10/6

Sheet Iron.—Galvanized Iron is in fair demand, but the volume of business is hardly up to the average, owing to the backwardness of the building industry. Prices are fairly well maintained. The demand for Black Sheets is usually light at this season, but at the present time this feature is intensified by the prevailing dullness of trade, and the market for this material remains extremely flat. Prices are low, and entirely in buyers' favor.

Chicago Report.

Scrap.—Business is light and offerings from country Scrap collectors are large. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Business is quiet. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5 25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8 20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8 20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE PERRY STOVE COMPANY, Albany, N. Y., are at the present time bringing into special prominence their line of Oil Stoves, more especially No. 24 Shoo Fly with two-hole removable extension top and shelf, the Argand and the Fire Fly. In a page announcement elsewhere illustrations of these goods are shown and some particulars given.

CONDITION OF THE

Hardware Trade.

REPORTS indicate that trade in the different parts of the country varies considerably in tone and volume. A general feature of it is its unevenness, the orders of one day or week being relatively large and encouraging, and those of the next more or less disappointing. From several sections there is evidence of a steady improvement in the condition of things, and the indications point toward a gradual movement in this direction. The small trade are buying somewhat more freely notwithstanding the complaints that are made in regard to this matter from some markets, as more fully referred to in some of the following reports. It is also a significant fact that some of the representatives of large Western houses have recently been placing orders for future delivery, and express the confidence that before very long there must be a marked increase in the volume of trade. In the matter of prices there is little to add to what was said last week, the market being devoid of strength in many lines, with a tendency toward lower quotations. Collections give little ground for complaint.

Advices from Chicago.— A little better demand is reported for Shelf Hardware and also for roofing and tinners' materials from the general country trade. House furnishing goods and tinware experienced a little increase last week, but the gain then felt has been lost by this time and trade has relapsed into its former dullness. Copper goods have advanced slightly in consequence of the increased price placed on sheet copper. The improvement in this line of business is, however, more than counterbalanced by the lower rates made on staple goods. The prices named by jobbers on the latter have been modified considerably during the past week, but greater concessions have been made to the city than to the country trade. Jobbers appear to be competing most vigorously for city business, although it is only a small proportion of the trade which they handle. Heavy Hardware jobbers have felt no improvement in their demand, but report their customers buying very sparingly and keeping stocks down as low as possible. Wagon builders are doing considerably less than last month and appear to be afraid to make up stock to any extent. Collections are fair.

Notes on Prices.

Wire Nails.—There appears to be something of a falling off in the volume of business, but the manufacturers are in receipt of many orders and are fully occupied. Some of these orders are from the large houses, but many of them are for comparatively small lots, the aggregate of the business, however, being large. Quotations are the same as last week, 95 cents at mill being a representative price, which is shaded only in the case of especially large and important orders. Small lots from store in New York are held at $1.20 to $1.25.

Advices from Chicago.—The advantages promised in February from the closer alliance made by Wire Nail manufacturers have all been lost, and the business in this branch has relapsed to its old condition. A prominent manufacturer says that, himself included, the manufacturers of Wire Nails are the biggest fools in the Iron and Steel trades. They have permitted themselves to fritter away one of the best opportunities they ever had to conduct a steady spring trade at a reasonably fair margin. The current demand is light, and yet the factories seem to be in possession of sufficient orders to enable them to run for the whole of this month and perhaps into the next. Their stocks are under the average held at this time of the year, and whenever specifications are sent in they are followed up promptly by telegrams if immediate shipments are not made. The trade, therefore, ought to be in good condition and prices ought to be maintained. Factory quotations are still about $1.05, Chicago, but with concessions on good sized quantities, while small lots from stock are selling at $1.15 to the country trade.

Cut Nails.—It is evident that the Eastern manufacturers are feeling more than for a long time the effect of Western competition, and within the past week or two some Western mills which have heretofore held aloof have been making quotations in Eastern markets. The price of Nails delivered in New York is 95 cents to $1 base. Small lots from store in New York are regularly quoted at $1.10 to $1.15.

Advices from Chicago.—The Steel Cut Nail manufacturers report a smaller volume of business, but they are still able to pick up enough orders to keep their works in operation. Prices are a little weaker, and may now be quoted at 95 cents on 55-cent average. Jobbers are selling small lots from stock at $1.10, but make concessions to the city trade.

Barb Wire.—There is a good demand for Barb Wire, but it is not so heavy as a few weeks ago. Manufacturers are, however, fully occupied with orders, and in some cases are not able to ship as rapidly as their customers would desire. Notwithstanding the volume of business the market is showing increasing signs of weakness, and concessions are made more freely than a few weeks ago. The market is represented by the following quotations on Four Point Galvanized delivered at the points named: Pittsburgh, $2.05 @ $2.15; Cleveland, $2.10 @ $2.20; Cincinnati or Allentown, $2.15 @ $2.25; Chicago or New York, $2.25 @ $2.35. There is more complaint in regard to irregularity in prices in Western markets than in the Eastern, but the effect of the concessions which are being made is quite generally felt.

Advices from Chicago.—The excellent demand for Plain Wire is perhaps having a better influence on the Barb Wire market than the actual demand for fencing from dealers and consumers. The miscellaneous consumers of Plain Wire are taking as large quantities as usual, so that there is less disposition to sacrifice the Barb Wire end, although business in this respect has fallen off to some extent. Prices on Galvanized Barb Wire may be quoted at $2.30 to $2.35 for small lots from stock, with 10 cents less for carload lots.

Cordage.—An increased demand is reported, being apparently stimulated somewhat by the low prices ruling. The market, however, is not in any better condition as regards quotations than at our last review, inasmuch as prices, in sympathy with the decline in raw material and as a result of active competition, continue low. The market is represented by the quotation of 6 cents base on Manila, a price which a few manufacturers decline to meet, but which on the other hand has by others been slightly shaded on large and attractive orders. Sisal and New Zealand hold quite steadily at 4 cents.

Sheet Zinc.—Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue revised discounts on Sheet Zinc under date of April 11. The price continues $4.50 for Sheet Zinc in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The extras are also unchanged. The discounts as revised are as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	11	11	11	11
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	17	16	15	14

All discounts are computed straight when money accompanies the order. Quantity discount is added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly

subject to the quotation of the class to which it belongs.

Combined Cutlery Case and Money Drawer.—This article is put on the market by the Waddel Wooden Ware Works, Greenfield, Ohio, by whom it is sold at $12.50 each.

Glass.—There is a continuance of the better feeling in the Glass trade which has been noticed during the past two weeks, and an increased firmness in prices. Manufacturers and jobbers have to a great extent withdrawn quotations, and in many cases have advanced prices. It is claimed that the stock of Glass in manufacturers' and jobbers' hands is less than 500,000 boxes, while the customary stock on hand at this season of the year is stated as having been 2,000,000 to 2,500,000 boxes; while efforts are usually made to increase that amount to 4,000,000 boxes or over before the shut down. The limited stock of Glass on hand and the prospect of an increased demand are the causes of stiffer prices, as it is understood that the present stock would not be sufficient to supply the demands of the trade for one month under ordinary circumstances. In addition to this there is reported less than two-thirds of the number of pots in operation, or 1038 pots. There have been meetings held by the Glass manufacturers of Pittsburgh and of the gas belt, and while no official report of the proceedings have been published, it is understood that there is a desire for unity on the part of both. Pittsburgh quotations are given as 85 per cent. discount for single and 85 and 10 per cent. discount for double strength Glass. Under date of April 12, a Cleveland jobbing house quoted 85 and 5 for single and 85 and 10 per cent. discount for double strength Glass in quantities less than 25 boxes. There is a feeling of encouragement among Plate Glass manufacturers and jobbers, with a price agreed upon by the entire jobbing trade of New York, it is stated, of 70 and 10 and 70 and 5 per cent. discount, according to quantity. French Plate is quoted at 70 and 10 per cent. discount.

Old Metals.—There has been some improvement in the demand for Old Metals, but prices do not show much advance. The demand is generally fair for Scrap Iron at former rates, but the market is weak. The following quotations represent the ruling prices given by New York dealers:

Heavy Copper	℔ lb	7½¢
Light and Tinned Copper	℔ lb	6½¢
Heavy Brass	℔ lb	5½¢
Light Brass	℔ lb	4½¢
Lead	℔ lb	3¢
Tea Lead	℔ lb	2¢
Zinc	℔ lb	2¾¢
No. 1 Pewter	℔ lb	14¢
No. 2 Pewter	℔ lb	7¢
Wrought Scrap Iron, ℔ gross ton	$9.00 @	....
Heavy Cast Scrap, ℔ gross ton	7.00 @	....
Stove Plate Scrap, ℔ gross ton	4.50 @	....
Burnt Iron, ℔ gross ton	3.50 @	....

Old Rags, Paper, &c.—There is a moderately active markct for these materials, but prices have not improved any. The following quotations are about the prices given by New York dealers:

No. 1 White Rags	℔ lb	3¼ @ 3½¢
No. 2 White Rags	℔ lb	2 @ 2¼¢
Mixed Rags	℔ lb	¾¢
Blues and 3ds	℔ lb	1 @ 1¼¢
Hard Sized White Shavings	℔ lb	2¼ @ 2½¢
No. 1 White Book Shavings	℔ lb	1¾ @ 2 ¢
No. 2 White Book Shavings	℔ lb	1 @ 1⅛¢
Light Book Shavings	℔ lb	¾¢
No. 1 Mixed Shavings	℔ lb	¾ @ 1 ¢
No. 2 Mixed Shavings	℔ lb	½ @ ¾¢
No. 1 Printed Books	℔ lb	1 @ 1¼¢
Ordinary Mixed Books	℔ lb	½ @ ¾¢
Newspapers	℔ lb	2-5 @ ½¢
No. 1 Manila Paper	℔ lb	1 @ 1⅛¢
No. 2 Manila Paper	℔ lb	⅞ @ ¾¢
Bogus Paper	℔ lb	½¢
Common Paper	℔ lb	⅜¢
Straw Chips	℔ lb	½¢
Binders' Clippings	℔ lb	½ @ ⅝¢
Jute Butts	℔ lb	1⅞ @ 2 ¢
No. 1 Jute Bagging	℔ lb	1 @ 1¼¢
Mixed Bagging	℔ lb	¾ @ 1 ¢
No. 2 Bagging	℔ lb	½ @ ¾¢
Hemp Twine	℔ lb	2 @ 2¼¢
Manila Rope	℔ lb	2¼ @ 2⅜¢
Jute Rope	℔ lb	1½ @ 1¾¢
Mixed Rope	℔ lb	¾ @ ⅞¢

Old Rubber.—The market for Old Rubber is fairly good. Prices rule about as follows, but are subject to variation and are somewhat irregular:

Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03½
Rubber shoes, less than carloads, ℔ lb	@	.03¼
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

Trade Notes.

Joseph Dixon Crucible Company, Jersey City, N. J., are putting the Cycle Chain Graphite on the market, which is the highest grade graphite reground with lubricating oil, and when applied to the chain of a bicycle, it is stated, penetrates the bearings and thoroughly lubricates and protects them from wear and rust. The same firm will soon put on the market the same material in the form of a solid stick, so that wheelmen can carry it in their tool bag.

The Rapid Safety Filter Company, 1343 Broadway, New York, are showing a variety of designs of their Filter, which filters the water passing through and cools it without letting it come in contact with the ice used for cooling. It will cool the water used, it is said, as fast as it will run from the faucet.

The advertisement of George H. Bell & Co., 114 and 116 Nassau street, New York City, directs attention to the Peerless Steam and Hot Water Heater. The announcement is made that this is the heater formerly known as the Schimpf Boiler, but the entire property and plant having recently been purchased by a syndicate, the name of the boiler has been changed to the Peerless.

A card in another column directs attention to the goods manufactured by the St. Louis Corrugating Company, 515 North Main street, St. Louis, Mo. This firm manufacture Sheet Metal Roofing, Siding and Ceiling of all descriptions from Sheet Iron or Steel, either black, painted or galvanized.

An advertising card issued by Fox & Fox, Isabella Building, Van Buren street, Chicago, Ill., calls attention to their business, which is that of glass brokers.

The Totten & Hogg Iron & Steel Foundry Company, Pittsburgh, Pa., manufacturers of Rolls and Rolling Mill Machinery, are operating their plant night and day. This firm are furnishing all the Mills, Shears, Engines and Boilers for the Emlyn Steel & Tin Plate Company of Summitville, Ind. They have just received an order from the Cumberland Steel & Tin Plate Company of Cumberland, Md., for three 24-inch Hot Mills complete, and an order from the Whitsker Iron Company, Wheeling, W. Va, for a large Double Shear and Engine; an order from the Morewood Company of Gas City, Ind., for a large Muck Shear, and an order from the Ohio Falls Iron Company of New Albany, Ind., for 22 Rolls.

E. E. Souther Iron Company, St. Louis, Mo., call attention in a card on another page to their Iron and Steel Roofing, and ask the trade to send for prices.

A meeting of the stockholders of the Joseph Dixon Crucible Company was held at their office in Jersey City, N. J., April 16, and out of 7345 shares 7215 votes were cast for the same board of management that has conducted the affairs of the company. The board elected consists of E. F. C. Young, John A. Walker, Daniel T. Hoag, Richard Butler, William Murray, Joseph T. Bedle and Jerome Gillett.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

The Detroit Heating & Lighting Company have received the contract and are putting in a plant for the lighting of the court house at Newark, Ohio.

The plans and specifications of the Oleson Block to be erected at Fort Dodge, Iowa, have been completed. It will be a three-story brick building, heated by steam, and will be furnished with all the modern conveniences.

The plumbing of the United States Post Office building in course of construction at Staunton, Va., has been let to Ed. Murray at a contract price of $2250.

Boyd & Schnaier, 347 Columbus avenue, New York, are doing the plumbing and gas fitting in the Montifiore Home, at Thirty-eighth and Hamilton streets, New York. They have just completed the contract for a new plumbing system, steam heating and marble work in the ten-story building at Broadway and Prince street.

G. Eaton will erect on Fulton street near Kedzie avenue, Oak Park, Chicago, a $6000 apartment house, to have exposed plumbing, steam heat and gas grate.

Hayward & Reynolds, 335 Columbus avenue, New York, are doing the plumbing work in the Empire Hotel, at Sixty-third street and Columbus avenue. The Durham system of house drainage will be used.

Wm. G. Morris, Frankfort, Ind., has the contract, amounting to $1000, for the plumbing work in connection with the Delphir water works extension. Sixteen hundred feet of 4-inch main will be laid.

In Cornelius Vanderbilt's Newport villa at Newport, R. I., which he calls "The Breakers," 25,000 feet of

the Newport indirect radiators are used and 10,000 feet of the same radiators are used in the chateau of Geo. W. Vanderbilt, at Biltmore, N. C. The radiators are made by the A. A. Griffing Iron Company, Jersey City, N. J.

THE E. KEELER COMPANY of Williamsport, Pa., have just completed the heating of the Y. M. C. A. and the Republican Club buildings in that city. In the former building a Boynton hot water boiler was used for service in connection with the swimming pool, and a Keeler 60 horse-power tubular boiler for the general heating. In the latter building a Boynton steam boiler for general heating and a hot water boiler of the same make, for bathroom purposes, were used. In both buildings the radiators were of the American Radiator Company's make. The company are at present engaged in the heating of the City Hall and Council Chambers, using one of their 60 horse-power tubular boilers and Corry radiators.

N. C. HARVEY & Co., Duluth, Minn., are to install two Gurney hot water heaters in residences at Duluth.

THE WALCOTT HURLBUT COMPANY, 175–177 Lake street, Chicago, have received an order from Hamilton Bros., Marion, Ind., for a Syphon Eduction closet range, to be placed in a school building.

COOK & CHICK, 253–255 Kinzie street, Chicago, have taken contracts for the steam heating in the apartment building of Charles Gloeckler, 583 La Salle avenue, and the store and flat building of M. Friend, 1047 Milwaukee avenue.

THE J. L. MOTT IRON WORKS 311–313 Wabash avenue, Chicago, are to place a No. 3 Star warm air furnace in the flat building of H. G. Byers, 76 Aberdeen street, and one of the same heaters in the residence of Nicholas Traft, South Evanston, Ill.

GEORGE C. STEVENS, Columbus, Wis., is fitting up the residence of ex-Governor J. F. Lewis with a Gurney hot water heater and radiators.

THE BOARD OF ALDERMEN of Somerville, Mass., at its last meeting passed resolutions appropriating the sum of $14,000 for a four-room addition to the Knapp school house, to be borrowed on funded debt account, and authorizing the making of a contract with A. A. Sanborn for the heating and ventilating of the Geo. W. Durell school house.

THE W. F. PORTER STEAM HEATING COMPANY, Minneapolis, Minn., have closed contracts with W. Elithorpe, 3132 Stevens avenue, and Peter Jurgenson, Tenth avenue S. and Eighth street. The former will have hot water system and the latter steam. The Page boilers will be put in both residences.

THE LAWRENCE PLUMBING & HEATING COMPANY of Lawrence, Kan., have been awarded the contract for the plumbing and steam heating for the new county court house and jail at McPherson, Kan.

M. J. CORBOY, 78 Dearborn street, Chicago, has the plumbing in the flat building of Heissler & Junge, Thirty-fourth and State streets; residence of Joseph Slogel, Belmont avenue, and flat building of E. Stanton, 330 Ohio street.

ARCHITECTS FABER & PAGELS, Chicago, have designed a new Methodist church to be erected at the corner of Northwestern avenue and Cortland street. The building will be provided with a slate roof, kitchen and furnace heat.

ARCHITECT CECIL S. CORWIN, Chicago, has designed for H. S. Mitchell a two-story attic and basement residence to be erected at Racine, Wis. The interior will be finished in hardwood and heated by hot water.

C. J. HAMBLETON, Chicago, will construct a four-story store and apartment building at the northeast corner of North Clark street and Belmont avenue after plans by Architect G. L. Hallberg. Steam heat will be used.

ARCHITECT FRANK L. WRIGHT, Chicago, has designed for R. W. Roloson four two-story houses to be built on the east side of Calumet avenue, near Forty-second street. Hot water will be used for heating.

ARCHITECT A. F. HUSSANDER, Chicago, has designed for T. F. O'Neil a large apartment house to be built at the intersection of Lincoln avenue and George street. It will be constructed of pressed brick and stone, with ornamental metal trimmings, and be heated by steam.

ARCHITECT W. J. VAN KUREN, Chicago, has designed for J. E. Decker a three-story apartment building to be erected on Park avenue, near Grove street, in Austin, Ill. It will be heated by steam.

ARCHITECT J. H. HUBER, Chicago, has prepared plans for a residence to be erected on Newport avenue, near the lake. The building will be heated by hot water.

AMONG the contracts recently taken for steam heating by the Kelly & Jones Company, 48 to 52 North Clinton street, Chicago, are the following: O. Scheunemann's building, Belmont avenue and State court, and residence of Henry J. Luders, 217 South Leavitt street.

THE D. S. MORGAN BOILER COMPANY, 22 West Lake street, Chicago, have contracts for steam heating in W. M. Grant's block on Michigan avenue, and in the residences of Mrs. E. M. Drew, Mrs. M. Hitt, H. B. Waterman and Tribelcock & Halligan, South Chicago.

THE JOHN DAVIS COMPANY, 69 to 79 Michigan street, Chicago, have the contract for hot water heating in the flat building of Giles Hubbard, Forty-fourth street and Indiana avenue.

COE & MCMILLEN, Monticello, Ill., have been awarded the contract for steam heating in the new school building to be erected at Monticello.

Avery Stamping Company, Cleveland, Ohio, who are known as pioneers in heavy metal stamping, are putting on the market a full line of stamped steel hollow ware and are in a position to fill orders promptly. The line includes solid and riveted handle spiders, solid and riveted handle cake griddles, bailed cake griddles, round, flat and pit bottomed kettles, maslin kettles, stew pans, Scotch bowls, stew pots, hotel steel stew pans and pots, also pure nickel hotel sauce pans. The goods are furnished either polished, tinned, mirror polished or enameled, and are described as light, strong, durable, clean and of attractive appearance. The first cost of these goods is referred to as being far below copper and as rapidly replacing the same. The company also furnish the goods polished on the inside for what is called grease cooking. Attention is called to the nickel sauce pans, and while they are a little more expensive at first cost than copper, they are guaranteed by the manufacturers for 8 or 10 years. Emphasis is placed upon the finish and quality of the entire line of these goods.

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Metal and Miscellaneous Prices.

CHICAGO, APRIL 19, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Calland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.65 @$5.75
IC, 14x20, 90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 Ionble these prices.

Brilliant, Tissue Packed, IC, 14 x 20. $9.25
Royal, extra, IC, 14 x 20 ..... 7.25
Merlon, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood —IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.50

Roofing Plates.

Palm, IC, 20 x 28 ..... @$11.25
Palm, IX, 20 x 28 ..... @ 14.00
Empire, IC, 20 x 28 ..... @12.00
Empire, IX, 20 x 28 ..... @15.00
Hickory, IC, 20 x 28 ..... @ 12.50
" 1X, 20 x 28 ..... @ 15.50
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska 1X, 20 x 28 ..... @ 17.75
Special, IC, 20 x 28 ..... @ 15.00
" 1X, 20 x 28 ..... @ 18.00
Merchant's Roofing (extra coated), 1C, 20 x 28 ..... @$17.75
Merchant's Roofing (extra coated), IX, 20 x 28 ..... @$21.50
Merchant's Old Method, (extra heavily coated), IC, 20 x 28 ..... @$19.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28 ..... $23.60
Westmoreland:
IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.00
Elwood:
IC, 20 x 28 ..... $11 50
Furmston:
IC, 20 x 28 ..... $11.00
Juno:
IC, 14 x 20 ..... $5.75
IC, 20 x 28 ..... 11.50
Illinois, Old Method:
IC, 20 x 28 ..... $17.00
E. L.:
IC, 20 x 28 ..... $12.50
Jessie:
IC, 20 x 28 ..... $12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resquarcd, 1X, 20 x 28 ..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20 ..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28 ..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia, IC, 14 x 20 (Stamped) 7.25
" IC, 20 x 28 (Stamped) 14.50
Maple, IC, 14 x 20 (Stamped) 6.75
" IC, 20 x 28 (Stamped) 13.50
Willow, IC, 14 x 20 ..... 6.50
" IC, 20 x 28 ..... 13.00
Knoxall, 1C, 14 x 20 ..... 6.25
" IC, 20 x 28 ..... 12.50
Globe, IC, 14 x 20 ..... 6.00
" 1C, 20 x 28 ..... 12.00
Miami, 1C, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
" 1X, 20 x 28 ..... 15.00
" (Redipped), IC, 20 x 28 ..... 17.00

Old Process:

1C, 14 x 20 ..... 9.25
IX, 14 x 20 ..... 11.25
1C, 20 x 28 ..... 18.50
IX, 20 x 28 ..... 22.50
H. B. L., Old Style:
1C, 14 x 20 ..... 7.75
IX, 14 x 20 ..... 9 25
1C, 20 x 28 ..... 15.50
1X, 20 x 28 ..... 18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 6%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.. ....dis. 75%

Copper—

Ingot.

Lake.....11¢ @ 11½
Casting Brands.....10¢ @ 10¼

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.34
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....4¾¢
300 ℔ casks.....5 ¢
Loose sheets.....5¼¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

List on following page.

1¼ and under, Plain	60&10%
1¼ and under, Galv.	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv.	60&10%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list. 50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz.	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list. 70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ 2 ¢
" " Brown	℔ 1½¢
" " Purple	℔ 2½¢
" Ground in oil, B. Red	℔ 6½¢
" Ground in oil, Red	℔ 6½¢
" Ground in oil, Brown	℔ 5½¢
" Ground in oil, Purple	℔ 6 ¢
Linseed Oil, Boiled, in oils	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9¾¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal.	34¢
Spirits Turpentine, in bbls., ℔ gal.	34½¢
Asphaltum, Trinidad Refined, ℔ ton.	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.78
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, APRIL 20, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	℔ ℔, 75¢
100-℔ lots	℔ ℔, 73¢
Ton lots	℔ ℔, 70¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	℔ ℔, 70¢
100-℔ lots	℔ ℔, 65¢
Ton lots	℔ ℔, 60¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	℔ ℔. 65¢
100-℔ lots	℔ ℔, 60¢
Ton lots	℔ ℔. 55¢

Antimony—

Cookson	℔ ℔, 10¾¢
Hallett's	℔ ℔, 9¾¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894

Plain Round Tube.	Per ℔.
¾-in. up to 2-in.	$0.35
⅝-in. up to ¾-in.	.36
½-in. up to ⅝ in.	.38
⅜-in. up to ½-in	.41
5-16-in. up to ⅜ in.	.48
¼-in. up to 5-16-in.	.65
3-16-in. up to ¼-in.	1.00
⅛-in. up to 3-16-in.	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 16, inclusive,	.38

25 @ 30%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..13¢ ℔ ℔, net

Ingot.

Lake	10½¢
Ansonia Grade Arizona	10 ¢
Ansonia Grade Casting	9¼¢
Planished	net
Sheet and Bolt	15¢ ℔ ℔, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz. 20%

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.50	2.80¢
Nos. 17 to 21	℔ ℔. 2.60	2.90¢
Nos. 22 to 24	℔ ℔, 2.70	3.00¢
Nos. 25 and 26	℔ ℔. 2.80	3.10¢
No. 27	℔ ℔. 2.90	3.20¢
No. 28	℔ ℔, 2.95	3.30¢
American B. B.	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11½@12½¢
Patent Planished ℔ ℔. A. 10¢ · B. 9¢ 5%
Craig Polished Sheet Steel.....℔ ℔ 8½¢

Galvanized.

	B. B
Nos. 10 to 16	75@75&10%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig	3½¢@4¢
Bar	4½¢
Pipe	5½¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6½¢, 20%

Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls.	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil: Raw, ℔ gal.	@ .40
Boiled	@ .43
Spirits Turpentine: In bbls.	@ .32
Putty: In barrels and ½ bbls.	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼
Roofing Material, &c.: Asphaltum, Trinidad Refined, ℔ ton.	$30.00@$35.00
Asphaltum, Rock, ℔ ton.	$14.00
Coal Tar Felt, 1 Ply, ℔ ℔	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl.	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 Inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₩ bbl. $1.22@$1.23
Rosin, E. & F.....₩ bbl. $1.35@$1.55
Rosin, G. & H.....₩ bbl. $1.75@$2.15
Rosin, I. & K.....₩ bbl. $2.35@$2.60
Rosin, M. & N.....₩ bbl $2.85@$3.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.50@4.25
Peach Bottom, ₩ sqr.....5.00@6.25
No. 1 Chapman, ₩ sqr.....4.00@4.65
Lehigh Slates, ₩ sqr.....3.00@4.50
Vermont:
Sea Green, ₩ sqr.....2.70@3.20
Purple, ₩ sqr.....3.50@4.50
Unfading Green, ₩ sqr.....3.50@4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼.....13½@14¢
No. 1.....11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....3½¢ } 5% dis.
½ bbls., about 300 ℔, ₩ ℔.....4¢ } 5% dis.
Kegs, about 110 ℔, ₩ ℔.....4¢ } 5% dis.
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢ } 5% dis.

Yager's Soldering Salts.
¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....21¾¢
Straits, pigs, ₩ ℔.....21¢ @ 21¼¢
Straits in bars, ₩ ℔.....22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20.....6.12
" IX, 14 x 20.....6.38
Apollo Roofing, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Atlantic, IC, 14 x 20.....5.75
Bouus, Extra Coated, IC, 14 x 20...6.75
" " IX, 14 x 20....8.25
Buckeye, IC, 14 x 20.....7.00
" IX, 14 x 20.....8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20.....5.37½
Climax, IC, 14 x 20.....5.50
Columbia, IC, 14 x 20.....7.00
Crescent, IC, 14 x 20.....6.00
Dane, IC, 14 x 20.....5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20.....5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28.....15.00
Empire, IC, 14 x 20.....6.12½
Extra Central, IC, 14 x 20.....5.62½
Flag, IC, 14 x 20.....5.25
Fort Pitt, IC, 20 x 28.....11.00
Globe, IC, 14 x 20.....5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20....6.25
Juno, IC, 14 x 20.....5.75
Kensington, IC, 14 x 20.....6.75
" IX, 14 x 20.....8.00
Knoxall, IC, 14 x 20.....6.00
Laufman's Apollo (Resquared), IC, 14 x 20.....8.12
Laufman's Apollo (Resquared), IX, 14 x 20.....9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20.....6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20.....7.00
Maple, IC, 14 x 20.....6.50
Merchant's Old Method (Resquared), IC, 14 x 20.....9.50
Merchant's Roofing (Resquared), IC, 14 x 20.....8.50
McKinley, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Newcastle Real Old Method, IC, 14x20, 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.25
N. F. Old Style, IC, 14 x 20.....7.50
" " IX, 14 x 20.....9.00
Old Colony, IC, 14 x 20.....8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20.....5.25
Palacio, IC, 14 x 20.....5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20.....8.00
Phœnix, IC, 14 x 20.....5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20.....9.25
Scott's Extra Coated (Resquared), IX, 14 x 20.....10.75
Taylor Old Style (Resquared), IC, 14 x 20.....9.25
Taylor Roofing, IC, 14 x 20.....8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20....6.62
" IX " 14 x 20....7.88
U. S. Monongahela, IC, 14 x 20.....6.10
U. S. Redipped, IC, 14 x 20.....8.25
Venus, IC, 14 x 20.....5.37½
Vigilant, IC, 14 x 20.....5.50
Waldo Redipped, IC, 14 x 20.....6.75
Westmoreland, IC, 14 x 20.....6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20.....6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....6.75
Hazel, IC, 14x20.....5.80
Iowa, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Linden, IC, 14x20.....6.50
Merchant's Dipped, IC, 14x20.....11.00
Merlon, IC, 14x20.....6.75
Mint, IC, 14x20.....6.00
Newcastle Russia, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
Newcastle Juniati, IC, 14 x 20.....0.50
" " IX, 14 x 20.....8.50
Newcastle Best Coke, IC, 14 x 20....6.00
" " IX, 14 x 20....7.25
Newcastle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.75
Palma Xtra, IC, 14x20.....7.00
Phœnix, IC, 14x20.....6.25
" IX, 14x20.....7.75
Royal, Extra, IC, 14x20.....7.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Youghiogheuy, IC, 14 x 20....5.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$7.56
20 x 28.....15.00
IX, 14 x 20.....8.75
20 x 28.....17.50
Pontymister Grade, IC, 14 x 20....6.50
20 x 28.....13.00
IX, 14 x 20....7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20.....5.75
20 x 28.....11.50
IX, 14 x 20.....6.75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....$5.37½
20 x 28.....10.70
IX, 14 x 20.....6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20.....5.25
20 x 28.....10.50
IX, 14 x 20.....6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Caland Grade. IC, 10 x 14.....$6.37½
" " IC, 12 x 12.....6.62½
" " IC, 14 x 20.....6.37½
" " IC, 20 x 28.....12.75
" " IX, 10 x 14.....8.00
" " IX, 12 x 12.....8.25
" " IX, 14 x 20.....8.00
" " IX, 20 x 28.....17.00
" " DC, 12½ x 17.....6.00
" " DX, 12½ x 17.....8.00
Allaway Grade. IC, 10 x 14.....5.75
" " IC, 12 x 12.....5.87½
" " IC, 14 x 20.....5.75
" " IC, 20 x 28.....11.50
" " IX, 10 x 14.....7.00
" " IX, 12 x 12.....7.25
" " IX, 14 x 20.....7.00
" " IX, 20 x 28.....14.00
" DC, 12½ x 17.....5.50
" " DX, 12½ x 17.....6.50

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20.....8.12½
20x28.....11.00
IX, 10x14, 14x20.....6.60
B. V. Grade.—IC, 10x14, 14x20.....5.40

Imported Boiler Plates
1XX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets).....14.50
1XX, 14x31..(112 sheets).....16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz...$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....52½&10&5%
1½ and over, Plain.....70&10&5%
¾ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joluts Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks.....₩ ℔ 4½¢
Per ℔.....5¢ @ 5¼¢

It Is Reported—

Alabama.

That R. A. Posey has recently commenced the Hardware business at DADEVILLE.

California.

That J. W. Morrison has sold his Hardware store at SANTA ANNA to S. C. Wright of MCPHERSON, KAN., receiving in payment therefor a section of Kansas land and other considerations. Mr. Wright will conduct the business under his own name.

Colorado.

That Judge Walter T. Brown, for years engaged in the Hardware business at FORT MORGAN, but a resident of DENVER the past eight months, has purchased an interest in the Mitchell-Patton Mercantile Company.

Connecticut.

That on the afternoon of the 14th inst. fire broke out in the attic of the establishment of the Way Hardware Company, HARTFORD, and an hour later when the flames were extinguished the stock in the store below had been damaged by water to the extent of about $10,000. The company carry a stock of nearly $25,000, and a good portion of this was thoroughly drenched. Rubber blankets were placed over the stock as far as possible, but the water came down in such floods that scarcely anything could be kept dry. The loss is fully covered by insurance.

Delaware.

That the large Hardware stock of Bellah & Co., WILMINGTON, has been disposed of at auction.

Georgia.

That the Hutchinson Lumber & Supply Company of CORDELE are intending to engage in the Hardware and mill supply business, doing both a retail and wholesale trade. W. B. Hutchinson is president of the company, C. E. Arnt, treasurer; A. Kirtland, general manager, and J. W. Moore, secretary.

Illinois.

That T. E. Peck has opened a new Hardware store at VIRGINIA. He will also carry Tinware and Stoves.

That S. J. Stebbins' Hardware store, at 39 Van Buren street, CHICAGO, was damaged by fire on the 9th inst.

That German & Friedman of PRINCEVILLE have bought out the Hardware and Implement business formerly operated by Mr. Moore, at BRIMFIELD.

That T. B. Bray has sold his interest in the Hardware store at ELIZABETH to his partner, H. Weir. Mr. Bray will probably enter the dry goods business in the near future.

That Burder & Co. are proprietors of a new Hardware store at ORION.

That the residence and Hardware store of F. Webber, FAIRBURY, were destroyed by fire on the 8th inst.

Indiana.

That the Hardware store of William M. Johnson, at ILION, was entered by burglars on the 10th inst., the safe broken open and $300 stolen.

That fire on the 5th inst. destroyed the stable and warehouse of J. B. Barnes, Hardware merchant, of ANDERSON. The loss was $2000, with no insurance.

Iowa.

That arrangements have been perfected so that Gortner & Burt are again conducting their Hardware business at LAKE CITY.

That burglars broke into John F. Hays' Hardware store, at CLINTON, on the 6th inst., and stole goods to the amount of nearly $200.

That Mr. Stalford of DES MOINES has purchased G. F. Brayton's Hardware store at PERSIA.

That Wilber Van Cleef has bought the Hardware store formerly owned by W. J. Wood, ELLIOTT.

That Ford & Bailey is the style of a new Hardware store at DUNCOMBE.

Kansas.

That the Hardware store of F. B. Orr, HARPER, was burglarized a short time since. About $100 worth of goods were stolen.

That C. W. Young, dealer in Hardware and Implements, GREENLEAF, has sold his stock of Hardware to C. O. Graves. Mr. Young will continue the Implement business.

That C. S. Lucas of MARYVILLE, Mo., has decided to open a Hardware store at ARGENTINE about May 1.

Maine.

That Kelley & Eastman's Hardware store, at RANDOLPH, was entered by thieves on the 9th inst. and $150 worth of goods taken.

That John Watson, Hardware merchant, of HOULTON, is building a large storehouse 50 x 150 feet.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A competent person to take charge of the polishing and buffing room of a large brass finishing establishment; must be familiar with iron work also; first-class references required. "Brass Worker," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

At once, an A1 PLUMBER and TINSMITH; one that can wipe a joint and do hot water fitting; to the right man a steady job, &c., year round and good wages; must be temperate and steady; give references and wages expected. P. E. Fraleigh, Red Hook, N. Y. Apr. 21

By a leading stove manufacturer, SALESMEN to sell first-class stoves in Southern Illinois, Missouri, Kansas, Nebraska and Northern Iowa; only men of experience who can handle first-class trade. "Stoves No. 42I," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

A few good reliable persons to work the retail stove trade in the cities of Baltimore, Washington, D. C., New York, Brooklyn, Syracuse, Rochester and Buffalo, N. Y., Richmond, Va., Wilmington, Del., Boston, Nashville and Memphis, Tenn., St. Louis. Geo. R. Moon, 561 Short avenue, Columbus, Ohio. Apr. 21

SALESMAN visiting the hardware and stove trade in Michigan, Indiana, Illinois or Iowa, to sell a first-class and ready selling line of house furnishing goods on commission; experienced salesman with estabished trade in territory only need apply. "Stove Trade," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Apr. 21

At once, good all round TINSMITH with some knowledge of plumbing; to steady, industrious man a steady job will be given; state wages expected, experience, and give name of last employer. E. A. Burbank, Berlin, N. H. Apr. 21

STOVE SALESMAN in Massachusetts, Rhode Island, Connecticut, New York and Pennsylvania can make good side commission by addressing O. G. & D. H. Donalson, Buffalo, N. Y. Apr. 14

A young man that understands tin and sheet iron business; one that can read and write a good hand and is capable of taking charge of store; please state wages wanted. "Capable," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

An A 1 STOVE SALESMAN for New York City trade; state age, experience and salary wanted. "J. B," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

SALESMAN for a first-class line of stoves for Ohio, Illinois, Minnesota and Wisconsin. "N. H.," No. 414, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 14

A first-class TINSMITH at once to work on milk coolers; one preferred with small capital. H. W. Gazley, Cortland, N. Y. Apr. 14

A RETINNER, with experience in retinning tinware, and capable of taking charge of a retinnery; steady job to capable man. Standard Stamping Company, Second and Chambers streets, St. Louis, Mo. Apr. 14

SITUATIONS WANTED.

A young man, 27 years of age, with 12 years' experience at tin and sheet iron work, roofing, cornice, furnace work, all kinds of general jobbing, stoves, ranges and heaters; speaks English and German. John Smith, care of Finck, 604 East Ninth street, New York City. Apr. 21.

As FOREMAN of iron foundry, by a thorough practical foundryman with six years' experience as foreman; can handle men and material in an economical manner. "H. J.," No. 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

By SHEET IRON SALESMAN; controls large Eastern trade on galvanized and black sheets. "B. B.," Box 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

A gentleman well posted in the requirements of the plumbing trade desires a position as manager or general agent to represent a first-class house manufacturing fine sanitary specialties; have had 23 years' experience in the manufacture of this line of goods, and can furnish considerable business to desirable parties. "Specialties," No. 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

By experienced mechanic as SUPERINTENDENT of manufactory making locks and builders' hardware a specialty; 15 years' experience as superintendent; understands the business in all its branches; can handle men and material economically. "M. C.," No. 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

Buyer's position by high class man; must be with large concern; export or otherwise. "H. & I.," No. 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

By a young man, 21 years of age, as SALESMAN in any line of business; two years' experience in stove business; can furnish excellent references. Chas. Frank, care of General Delivery, P. O., New York City. Apr. 21

By a first-class PLUMBER; seven years' experience; good references. Lock Box D, Haverhill, Mass. Apr. 21

By a man with ten years' experience in TIN and SHEET IRON WORK; thoroughly understand heating by steam, hot water and hot air; can lay out, estimate and do work from architect's plans; strictly temperate and reliable. J. P. Lisk, 636 Monroe street, Brooklyn, N. Y. Apr. 21

By an experienced TINSMITH, good jobber, steady work desired. E. Gold, 62 Boerum street, Booklyn, N. Y. Apr. 21

By a first-class PLUMBER; country preferred. Patrick Deroin, 147 Amsterdam avenue, New York City. Apr. 21

Steady position desired by a first-class STOVE PATTERN FITTER; 18 years' experience; best of references. Tony Schafer, 629 Rigdon street, Hamilton, Ohio. Apr. 21

By a first-class TIN and SHEET IRON WORKER on range, heater and general jobbing, also good practical plumber and pipe fitter; well up on pump work and hot water heating; middle aged man; A1 reference. "I. P.," 2396 Third avenue, Room 119, New York City. Apr. 21

As PLUMBER, by a young man, experienced, not afraid to work. Oscar Bormann, 1325 Second avenue, New York City. Apr. 21

As TINNER; 15 years' experience at inside and outside general job work, also pump and pipe work; small city preferred. "Tinner," 629 Georgia street, Pine Bluff, Ark, Apr. 21

As TINSMITH; first class in shop; city or country; 10 years' experience. Jas. Calder, 11 West street, New York City. Apr. 21

As FOUNDRY FOREMAN, a practical stove plate and bench molder who has had long experience as foreman; competent in handling men, melting and all modern foundry practice; strictly temperate; first-class references from past employers. "Western," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Apr. 21

By a TINSMITH; in and outside worker, understands furnace, range and heater work, roofing, spouting and plumbing; 16 years' experience; married; German; steady job by the year "Willy," care of A. Maass, 339 East Twenty-second street, New York City. Apr. 21

A first-class PLUMBER, STEAM and HOT WATER FITTER would like to engage with some party now in business or about to start in that line on a percentage or by the year; will make a trial of one or two months; will go to any part of the country. B. J. Parker, Station A, New York City. Apr. 21

By a TINSMITH; 14 years' experience at inside and outside work—roofing, steam and hot water fitting and general jobbing; sober and reliable; married; good references; state wages. A. J. Bouchey, Catskill, N. Y. Apr. 21

A man versed in the mixing of enamels and in the application of enamel to sheet and cast iron, would like position with a good concern; one making plumbers' supplies preferred. "Enamel," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

By a young man with six years' experience at TINSMITHING, and recently graduated from the Plumbing Department of the New York Trade School, a steady position; regular habits and willing to work. "E. B.," 300 East Sixty-seventh street, New York City. Apr. 21

As GENERAL HELPER in a hardware, stove and tin store or shop; three years' experience at trade; good at roofing and spouting; best of habits and reference. J. Bowers, Walkerton, Ind. Apr. 21

By a good all round TINSMITH on roofing and general jobbing; used to country work; city or country. John Philips, 154 Madison street, New York City. Apr. 21

By an experienced TRAVELING SALESMAN in the stove business; would prefer to work in Illinois, Iowa or Nebraska; would make salary a special inducement and give satisfactory references. "N. W.," office of *The Metal Worker*, 22-24 Pickering Building, Cincinnati, Ohio. Apr. 21

By a TINNER, PLUMBER and STEAM FITTER of 20 years' experience at city and country work. "Plumber," care of Wm. Sofieiss, Woodbury, N. J. Apr. 21

By a married man, 30 years of age, as SALESMAN or GENERAL MANAGER in retail hardware, stove, tin and housefurnishing store; have had ten years' experience; best of reference furnished. "H." 3209 Clifford street, Philadelphia, Pa. Apr. 21

By a HARDWARE CLERK; thoroughly posted in heavy and light hardware. "Competent," 25 Smith street, Middletown, N. Y. Apr. 21

By a TINNER, SHEET IRON WORKER and GENERAL JOBBER; good knowledge of plumbing and heating; country preferred; excellent reference from last employer; married. H. Ridge, Lock Box 44, Dalton, Mass. Apr. 21

By a practical TINSMITH and ROOFER, 22 years of age; city or country. Louis Katz, 62 Catharine street, New York City. Apr. 21

By a first-class TINSMITH and ROOFER; good jobber on plumbing and gas fitting; steady work desired; city or country. Harry Rosenbloom, 246 Madison street, New York City. Apr. 21

By a first-class PLUMBER; country preferred; best of references furnished. John Elgin, 546 East 117th street, New York City. Apr. 21

By a young man, 24 years of age, with eight years' experience at all outside work as roofing, gutters, &c.; also understands furnace, stove, range, heater work and general jobbing. L. Smith, P. O. Box 32, Manhasset, Long Island, N. Y. Apr. 21

By a first-class PLUMBER; country preferred; best of references. George Blessing, 2359 Eighth avenue, New York City. Apr. 21

On the road for heater manufacturing company, by SALESMAN who can control trade; best of references. "Trade," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

Hardware; AI hardware man and a first-class SALESMAN of several years' experience in the wholesale and retail business; thoroughly posted on builders' and general hardware, house furnishing goods, stoves and ranges; reference from late employer; single; age 27. "Casten," 524 Mulberry street, Scranton, Pa. Apr. 21

By a first class PLUMBER city or country. John J. Reilly, 203 East Thirty-sixth street, New York City. Apr. 21.

By a TIN and SHEET IRON WORKER, who is also a gas and hot water fitter; 15 years' experience at general jobbing; reference. J. Walden, New Rockford, N. D. Apr. 14

By a good TIN, SHEET IRON and FURNACE WORKER; understands steam and hot water fitting and the combination steam and hot air work. Chas F. Snyder, 73 East Louisa street, West St. Paul, Minn. Apr. 14

By a young man 20 years of age, with three years' experience at plumbing and gas fitting; can wipe a good joint; some knowledge of tin, sheet iron and range work; city or country. F. V. Martin, Box 153, New Milford, Conn. Apr. 14

By a perfect TIN, SHEET IRON WORKER and ROOFER; steady position in or out of town. T. Greenberg, 64-66 Canal street, New York City. Apr. 14

By a practical TIN and SHEET IRON WORKER; some knowledge of furnace, range, heater work, roofing and general jobbing. "Tinsmith," 242 North Second street, Williamsburg, Brooklyn, N. Y. Apr. 14

By a PLUMBER; learnt trade in Philadelphia; plumbing, gas, jobbing or steam work, sanitary drainage, and house wiring on Edison system; age 23; honest, sober and willing to work; can furnish reference. Henry M. Wendel, 32 S. Wyoming street, Hazleton, Pa. Apr. 14

By a TINNER; four and a half years' experience; can do roofing, spouting, stove, pump and shop work; strictly temperate; best of references. A. F. Segerstrom, Forest City, Iowa. Apr. 14

By a CORNICE and SKYLIGHT MAKER, as FOREMAN of a small shop or assistant cutter in a large shop; nine years' experience; 27 years of age; understands English and German. L. D. Retman, 111 Delancey street, New York City. Apr. 14

By a good TINSMITH, for in and outside work, used to country work, also general jobbing; willing to work in city or country. Address J. Cohen, 148 Delancey street, New York City. Apr. 14

Special Notices.

NOTICE OF ASSIGNMENT.

Notice is hereby given that John B. Fisk of the Borough of Hightstown, in the County of Mercer, State of New Jersey, has this day made an assignment to the subscriber, of his estate, for the equal benefit of his creditors, and that the said creditors must exhibit their respective claims under oath or affirmation, to the subscriber at his store, on Main street, in said borough.

ELWOOD ELDRIDGE, Assignee.

Dated March 19th, A. D. 1894.

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An 8-in. Saunder's Pipe Cutting Machine Apply to "PIPE CUTTING,"
office of *The Metal Worker*, 96-102 Reade Street, New York.

FOR SALE.

Hardware store and Tin Shop in growing railroad town. For reasons address
LOCK BOX 175,
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FOR SALE.—Very cheaply on account of other business, a Plumbing, Tin and Sheet Iron, Stove, Furnace and Range business in a New Jersey town of about 20,000 inhabitants. Terms reasonable. Address "NEMO," office of *The Metal Worker*, 96-102 Reade St., New York.

GOOD-WILL AND FIXTURES of a Sheet Iron and Metal Works, established nine years, including specialty if desired. Steam power or electricity. Ample space to enlarge. Good chance for a young man. Lack of capital cause for selling. Address "G," 414, office of *The Metal Worker*, 96-102 Reade Street, New York.

FOR SALE.

An enameler of 30 years' experience, about retiring, offers for sale his own and some of the best American and English receipts for enameling. All good and tested. Apply in first place to "GLASS," office of *The Metal Worker*, 96-102 Reade St , N. Y.

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with or without real estate. Established over 17 years. Owner wishes to retire from active business. Address or apply to

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OIL STOVES WANTED.

Will buy a lot with iron tanks. Any size. Must be cheap for spot cash.
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One No. 5 Sturtevant Fan and Counter Shaft, with 38 feet of 11½-inch Galvanized Iron Blow Pipe. Address
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One Stow's 31 inch Geared Power Squaring Shear. Will cut 3-16 in. iron, or lighter. Used very little. Call on or address
TINNERS' MACHINERY & SUPPLY CO.,
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A large commission to handle the diamond Extension Stove Back. Aluminum Model furnished. Sells nicely as a side line. Any part of the United States. One dozen weighs 100 pounds. Apply to
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Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish at 3 to 6 cents per pound. Send for circulars.
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FOR the accommodation of Stove Dealers who desire to undertake the summer storage of stoves for their customers, we have printed books of Receipts arranged on a new and ingenious plan. The Receipt to be given to the customer is on one side of the page, and on the other side is a Memorandum of the conditions, needed repairs and storage charges agreed to. *Opposite the Receipt* is its Duplicate, and *opposite the Memorandum page* is its Duplicate. When the leaf which has the Receipt on one side and the Memorandum on the other is torn out for the customer, it leaves Duplicate of Receipt and Memorandum on pages facing each other.

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Substantially Bound in Canvas.

100 Receipts and 100 Duplicate Records, $1.00.

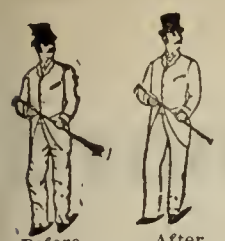
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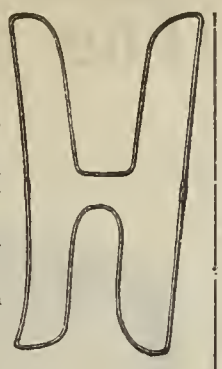
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THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Stretcher cannot get out of order, and can be adjusted in the pants in a few seconds.

It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

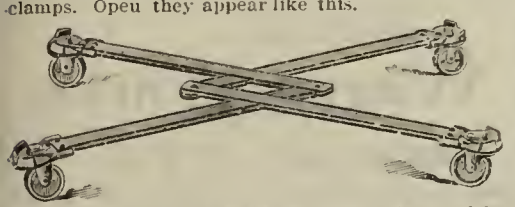
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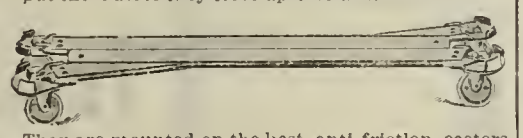
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FIT any stove and hold it secure without the use of nuts, screws, bolts or clamps. Open they appear like this.



But when you are through with them and want to put them aside they close up like this.



They are mounted on the best anti-friction casters and are fully warranted.

We make this season two kinds. All Steel at $18.00 per dozen. Wood and Steel, $15.00 per dozen.

If you have never seen one send for sample at dozen rates.

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SHOULD BE USED ON EVERY

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as they hold the heat back, retaining it just where it is wanted, with no smoke or gas in the room, saving 25 per cent in fuel.

SEND FOR CIRCULARS.

HODGE BROS., 13 Chardon St., Boston, Mass.

He Got His Drink.

A red nosed wayfarer, says a Chicago journal, dropped in a casual way into a saloon on State street the other day and called for gin. He didn't look exactly like a gin customer, but the bartender, after a brief glance at him, placed the desired poison before him.

"Come to think about it," said the fellow, reflecting a moment, "I don't reckon gin's what I want. If you don't mind tradin' me a whisky straight fur it I b'lieve I'd ruther have the whisky."

"All right," said the bartender, pouring the gin back and setting out a black bottle and another tumbler. "There's your whisky."

Old Dusty filled the glass, emptied it with evident relish and started for the door.

"Hold on!" said the white aproned man behind the bar.

"What for?"

"You haven't paid for you whisky.

"Didn't you trade me the whisky for the gin?"

"Yes, but you didn't pay for the gin."

"Well, I didn't drink the gin, did I? What are you beefin' about?"

He shuffled hastily out through the door, the bartender being apparently too much taken aback to make any effort to stop him.

"Served you right," said a man who had been leaning against the bar. "You ought to know better than to be taken in by such an old game as that."

"That's all right," replied the other, setting the bottle back on the shelf he had taken it from and wiping off the counter. "We're generally loaded for dead beats. In about 15 minutes, when the medicine that's in that decanter of whisky takes effect, he'll be the seasickest man this side of the Atlantic Ocean. Brandy punch? Yes, sir."

His Contract.

"See here," said the citizen as he put a stubby finger down on a copy of the paper, "dis here item says dat I got a contract workin' for de State."

"Well," said the editor, "we understood that you had been awarded a carting contract."

"So I has, and I want you to say so in de nex' paper. De way it come out, widout sayin' wot de contract was, about half me frien's will t'ink I been sent to de pen."
—*Indianapolis Journal.*

— "TICKET, sir," said an inspector at a railway terminus in the city to a gentleman who, having been a season ticket holder for some time, believed his face was so well known that there was no need for him to show his ticket.

"My face is my ticket," replied the gentleman, a little annoyed.

"Indeed," said the inspector, rolling back his wristband, displaying a most powerful fist; "well, my orders are to punch all tickets passing on to this platform."

— SCENE (staircase of a newspaper office) —A. (excitedly): "There's been an awful to do in the editorial department."

B.: "Why?"

A. (hurriedly): "Why, the housekeeper made a mistake and put 'No admittance' on the advertising office door and the 'Welcome' mat in front of the editor's room."

— SPRING CLEANING. — The Wife: "John, these carpets must be beat."

The Husband: "Why, my dear, when I bought them the dealer told me they couldn't be beat."

CLAD'S

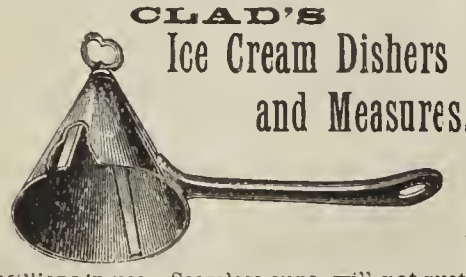
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124 MAIN STREET, CINCINNATI, O.

— NOT THE CASE.—"I am not expecting any package," said the lady of the house.

"This is the number," persisted the driver of the delivery wagon, looking at his book again. "Name's Higgins, ain't it?"

"Yes."

"No. 374?"

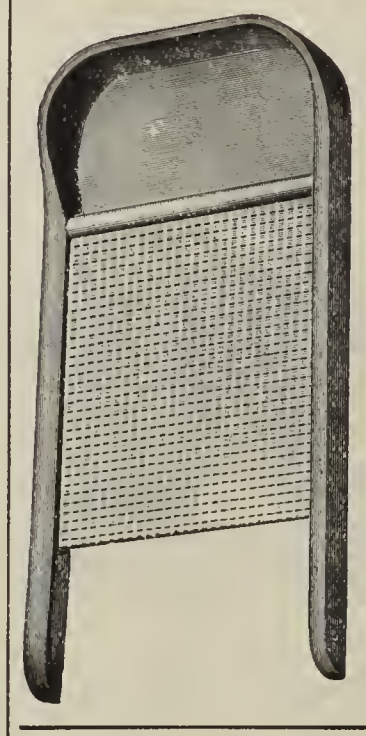
"That's our number."

"Then it's for you."

"I think not. It must be a case of mistaken identity."

"No, mum. It's a case of beer."—*Chicago Tribune.*

The Utility Washboard



Is a Zinc Board made from best quality No. 6 Zinc, the heaviest and strongest Zinc in use for Washboards.

CRIMP—The Crimp is our Improved Deep Globe, acknowledged far superior to any now in use on other boards.

OFFERS—absolute protection from water at sides as well as the top of the soap board.

WHY?—Because being made of one piece which is bent thin and broad at the sides and top of soap board where all splashing occurs, it is impossible in washing to splash over it.

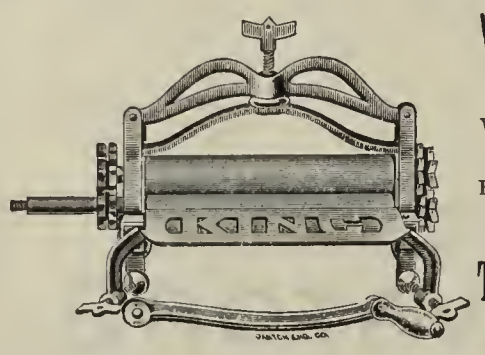
CONSTRUCTION—The Board in point of construction excels anything of its kind ever produced. Its lines present a symmetry and regularity pleasing to the eye, and in point of strength is unquestionably superior to any.

SALES—Where these are offered for sale competing boards are not "in it."

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We are Sole Manufacturers of the Celebrated Erie and King Wringers.

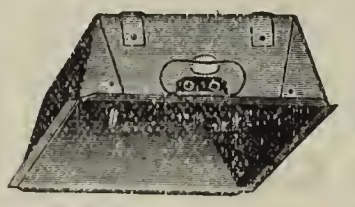
We also make all other brands of Wood and Iron Frame Wringers.

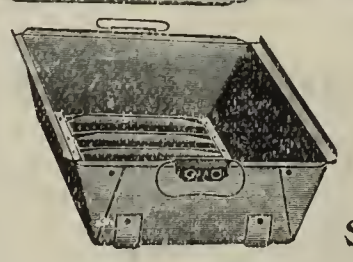
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ROASTER and BAKER.

Owing to its construction a free circulation of air is assured. No other Roaster has this feature. The best ever offered, because it produces better results than others.

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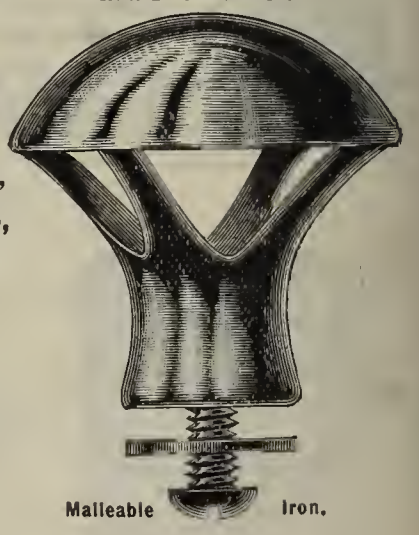
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Tea Kettle and Cooker.

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COMBINED IN ONE

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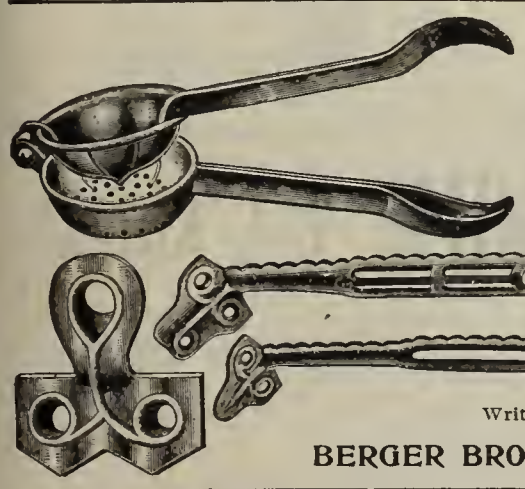
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YOUR DEALER HAS IT.

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IF SO,

You want our SQUEEZER.

Positively the best. Suitable for any size lemon.

We also make the finest

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in the country. Beautiful designs; all sizes; large stock.

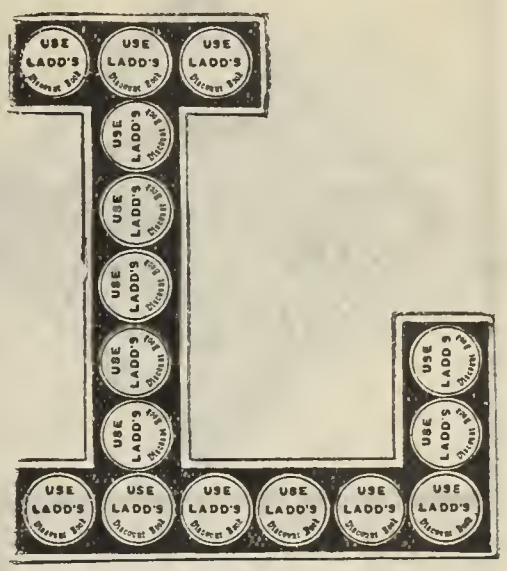
Write for Samples, Catalogue and Prices.

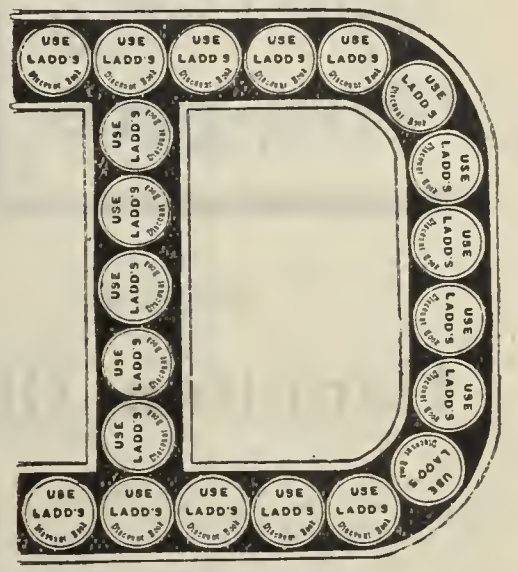
BERGER BROS., 237 Arch St., Philadelphia, Pa.

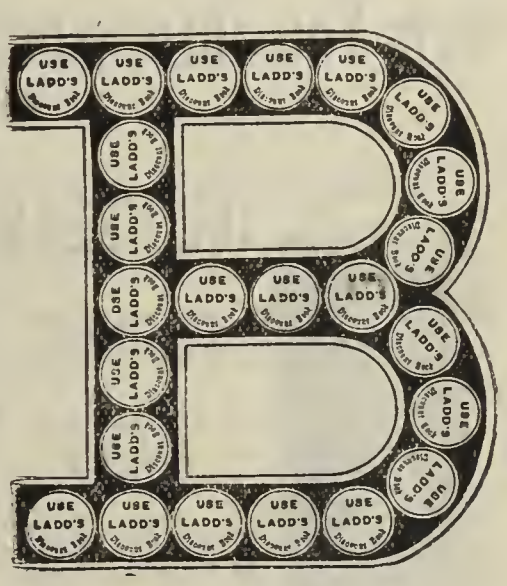
The sample tells the story!

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RAPID,

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For Sifting Flour, Straining and Measuring Fruits, Liquids and many other purposes. Is unquestionably the handiest device ever offered for use in the Culinary Department.

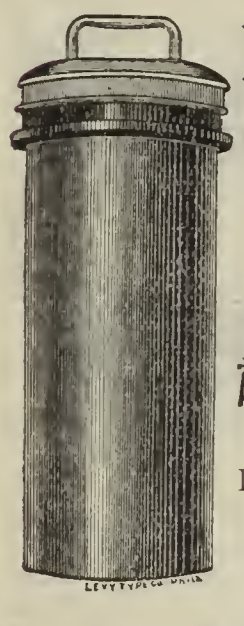
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ICE CREAM STORAGE CANS

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Climax Flour Sifter

Is the Latest and Best Flour Sifter on the Market.

SOME OF ITS ADVANTAGES ARE:

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It is done with a natural motion of the hand.
It has a cover and does not scatter the flour.
It has an agitator that will not grind foreign substances through the wire netting.

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"ERIE" ALUMINUM TEA KETTLE.

This TEA KETTLE is made of "PURE METAL," all in one piece. No SPOUT to melt off. No SEAMS to open. No chance for LEAKAGE. Will not RUST or CORRODE. No plating to wear off. STIFF, FIRM and INDESTRUCTIBLE. Altogether the NEATEST, PRETTIEST, BEST, LIGHTEST one piece and most durable TEA KETTLE ever offered.

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With Its New Finish.

The New Improved "American" Waffle Iron, { With Special Features for Gas and Gasoline Stoves.

Griswold Mfg. Co., = Erie, Pa.

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"No, your honor. My lawyer took my last shilling."—*Puck.*

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COOKERS, COFFEE POTS AND OTHER SPECIALTIES.



Cooks Quicker than any other Porcelain Rice Boiler made.

"NEVER-BREAK"

Wrought Steel Spiders, Griddles, Kettles, Stew Pans, Maslins, Scotch Bowls, Etc.



Flat Bottom Kettles, Four Sizes. Polished, Tinned AND Porcelained.

"EXCELSIOR"
ROASTING AND BAKING PAN.
Planished and Plain Steel.



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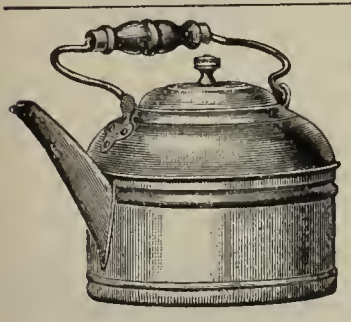
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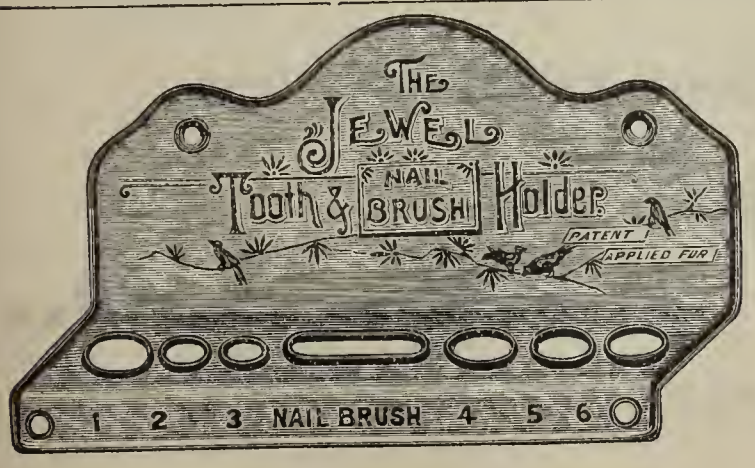
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RANGE KETTLES and NICKEL PLATED COPPER TEA and COFFEE POTS.



THE ROME Tea Kettles are full size and weight of metal. Have seamed in spouts that cannot be melted off. Handles of one piece of wire running through the wood. These goods are the best and cheapest on the market.

ROME MANUFACTURING CO. 135 AND 137 SOUTH JAMES ST., **ROME, N. Y.**



The "JEWEL"

TOOTH AND NAIL BRUSH HOLDER.

(Patented Feb. 6, 1894.)

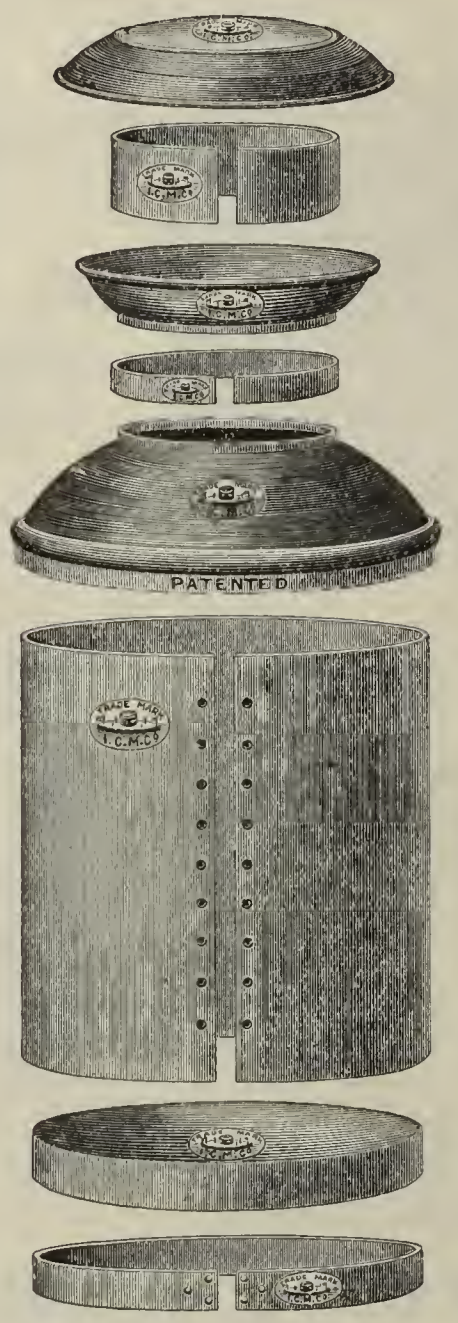
THIS new and novel article fills a long-felt want for an attractive, durable and useful Tooth and Nail Brush Holder. It will hold any size brush, and, as each opening is numbered, the brushes are kept separate and there is no possibility of getting the wrong one. The ornamentation is lithographed on the surface, and it will not peel or wear off.

For sale by all first-class jobbers in House Furnishing Goods, Hardware, Druggist Sundries and Department Stores. Sample mailed on receipt of 15 cents.

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CAUTION!

Every genuine IRON CLAD MILK CAN has our registered trade-mark stamped on each and every part of the stock from which the cans are made up. All others are either imitations or **INFRINGEMENTS.**



Improved Breast, with Inside Hoop.

PATENTED.

FURNISHED WITH

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Perfect Satisfaction and Good Value Guaranteed.

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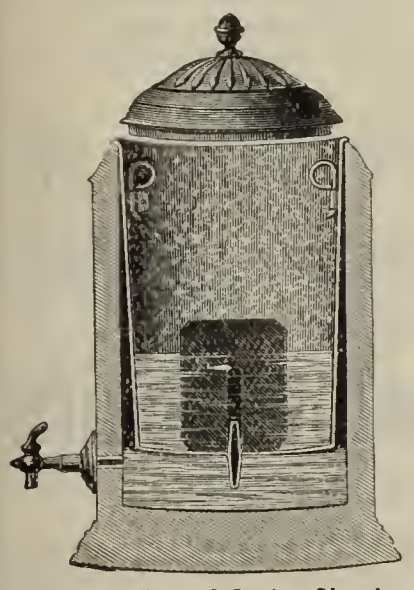
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The "CENTRAL" Filter=Cooler.

——WITHIN REACH OF EVERY FAMILY.——

CLARIFIES AND PURIFIES THOROUGHLY—NO TASTE OR SMELL—ONLY PURE CARBONS USED—REMOVABLE FOR CLEANING.

The "CENTRAL" Filter=Cooler is an adaptation of a device long in use abroad, especially in France, Germany and England. Heretofore applied only to expensive constructions, it is now brought within reach of every household. The cooler, complete, costs but little more than the ordinary article, while the filtering device is of the very highest quality. The carbons are pure and easily detached for cleaning; the filtering cylinders are made to fit **all our regular series of Coolers.** An important feature of the Filter-Cooler is the **separation** of the **ice** from the **filtered water.**



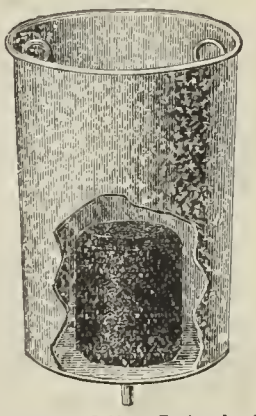
Sectional View of Cooler Showing Filter in Position.

Prices and Sizes—Cooler-Filters Complete.

GALLONS—	2	3	4	6	8	10	14
Japanned or Crystal, each,	$4.50	5.00	5.75	7.00	8.50	10.50	14.50
Extra Heavy—Japanned, with side handles, each,	$6.00	6.50	7.50	8.75	9.75	12.00	16.50

Filter Cylinders Only, Fitted with Carbons.

GALLONS—	2	3	4	6	8	10	14
Each,	$2.50	2.75	3.00	3.50	4.00	4.50	5.50



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THE CENTRAL STAMPING CO.,

23 and 25 CLIFF STREET, - - NEW YORK.



Cream City Flue Stops.

Decorated,
Gold Lacquered.



G. & P. Flue Stops.

Handsomely
Lithographed Fronts.

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THE TRIUMPH COOKER,
WITH LOCK COVER.



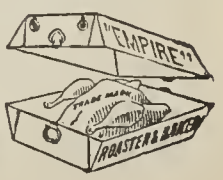
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THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.
A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.
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NEW YORK ELBOW CO.,

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Makers of
Elbows
AND
Roasters.



NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. / Chicago, Ill.

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 in.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
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Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

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PHILADELPHIA, PA. - J. W. PAXSON & CO.



THE WHITING CUPOLA

Is especially adapted for Stove Foundry use.

CRANES, LADLES, TUMBLERS, &c.

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MARCY STOVE REPAIR CO.

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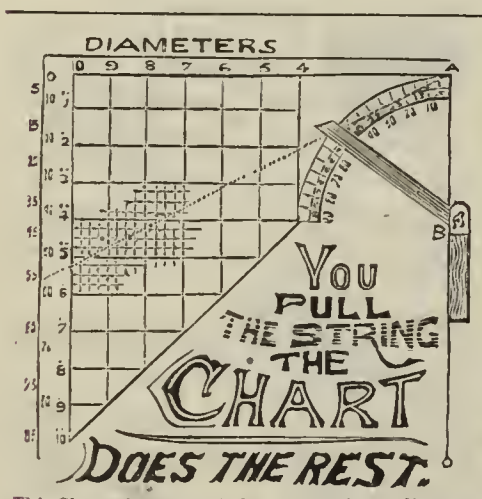
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Agents of THE GLOBE VENTILATOR CO.,

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This Chart gives more information about elbow patterns than a mammoth book could hold. A pattern made in five minutes for **any Elbow.** 50 cents by mail. Address

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Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

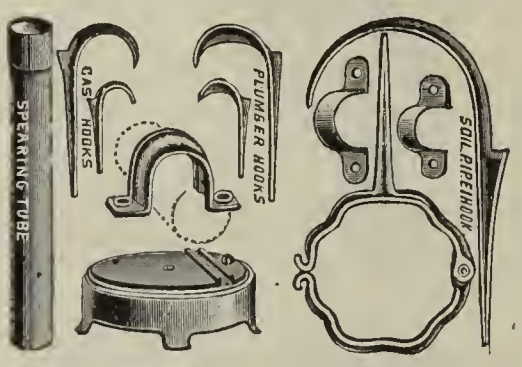
MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜



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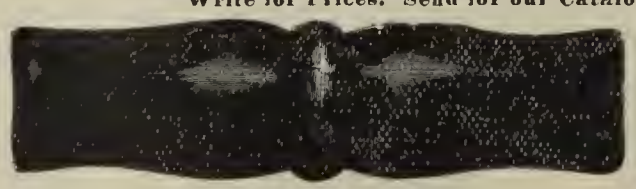
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PLAIN, POLISHED AND ENAMELED

Handles, Pail Woods and Knobs.

WARREN, OHIO.

Write for Prices. Send for our Catalogue.



No. 7½, size ¾ 2¾.
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No. 6½, " " No. 7½, 1⅛ x 4.



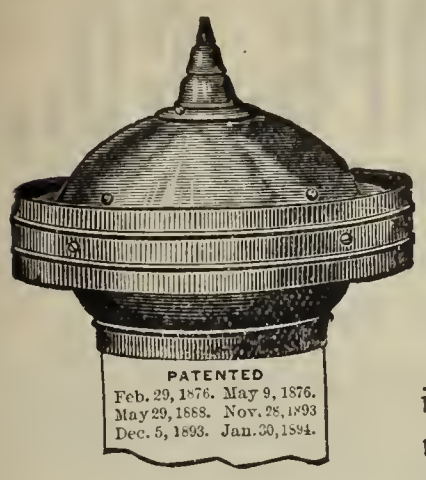
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— PENELOPE (who is reading aloud one of Howells' novels): "This chapter is superb!"

Phyllis: "Yes; one almost expects the characters to stop talking and do something."—*Brooklyn Life.*

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The Sufferer: "No, no; I didn't swallow that."—*Elmira Gazette.*



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—FOR A—

GLOBE VENTILATOR.

Cast your eyes over the house roofs, and there you see them standing like silent sentinels, to guard the lives and preserve the health of those within

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IS GOOD, IS BETTER, IS BEST.

Foundrymen who are using it say there is nothing its equal. Samples free. Write for complete Catalogue of Foundry Supplies.

THE J. D. SMITH FOUNDRY SUPPLY CO., - CINCINNATI, O.

Our repairs are sure to fit, as they are all made from manufacturers, original patterns

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STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

PERHAPS

YOU DON'T KNOW
RUTLAND LINING
FITS ANY STOVE
AND IS CHEAP.

RUTLAND FIRE CLAY CO., - RUTLAND, VERMONT.

DON'T FORGET

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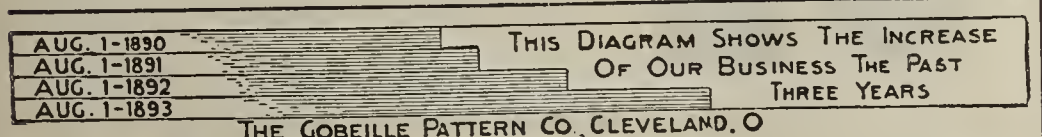
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Modern and Ornamental Drawings and Patterns for Stoves, Ranges and Furnaces made to order.

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Dressed and Boarded or in the Rough.

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Manufactured by
S. CHENEY & SON
MANLIUS, N. Y.

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Mrs. Newrich: "I'm glad you mentioned it. I'll have Mr. Newrich get tickets for it right away."—*Chicago Inter-Ocean.*

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FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

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This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

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The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published

Sent, post-paid, on receipt of price, 25c.

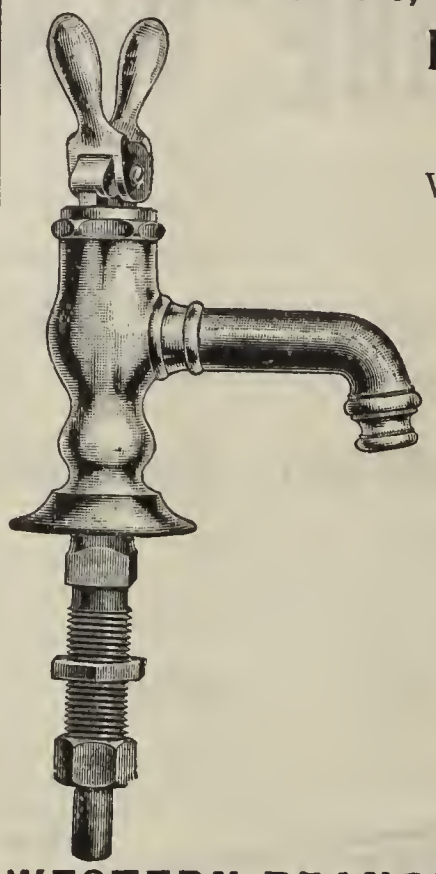
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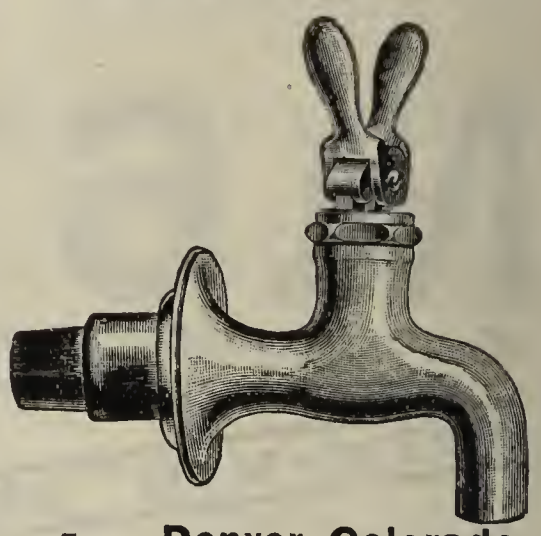
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We are now making a full line of Doherty work. Circulars and prices upon application.



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SHOWING SAFETY SPRING.

Rain Water CUT-OFF.

For turning the water into or off the cistern.

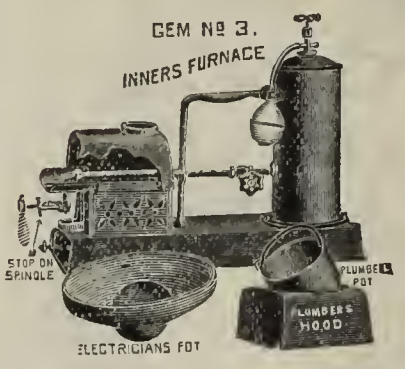
G. W. Howell,
Mfr.,
Covington, Ky.

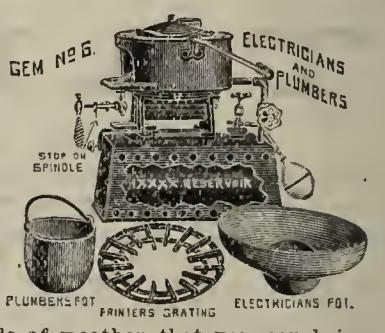


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The GEM GASOLINE

Soldering Furnaces.





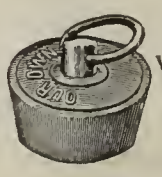
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IF OUR GEM No. 3 and 6 cannot be worked out of doors or on roofs in all kinds of weather, that you can bring them back and your money will be returned. CAN YOU ASK MORE?

All have cylindered cast iron burner so arranged that solder cannot clog them.

Ask your Jobbers for them or Write for Prices.

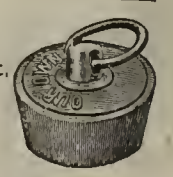
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With Nickel Trimmings are the Neatest and Best.

SAMPLE DOZEN ASSORTED $1.



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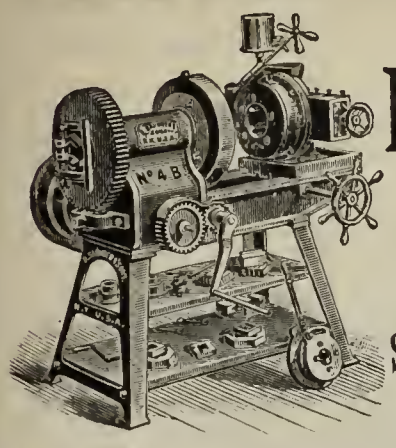
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All sizes ¼ inch to 16 inch for Pipe Mill, Gas and Steam Fitters' use. Tapping Machines for steam-fittings, also

STEAM and GAS FITTERS' HAND TOOLS.

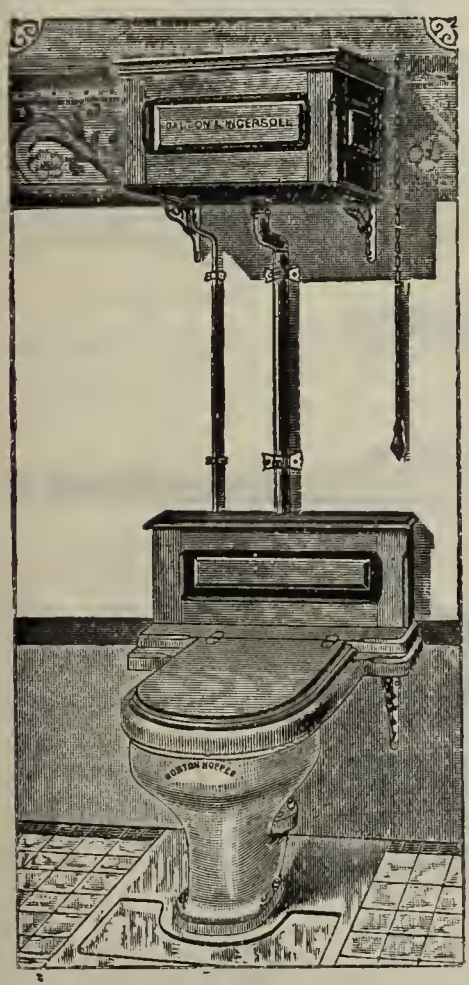
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(TRADE-MARK.)



Considered the perfection of closets. It is a modification of what is known to the trade as a Short Hopper and Trap combined. Its exterior outline is in pedestal form, which gives perfect support to the bowl. This construction will allow the seat to rest directly on the closet, dispensing with the use of seat legs, if so desired, allowing a better opportunity for cleaning around the closet. This feature of construction will recommend itself to those looking for simplicity and cleanliness.

[See our advertisement next week for sectional view.]

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TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



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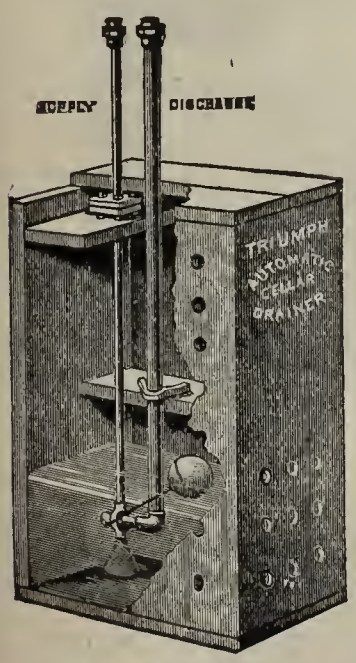
Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

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—FOR—

WET CELLARS.



The Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

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The other, straightening himself up, replied in a tone loud enough for all to hear: "No, sir, I won't lend you £5. I haven't got it on me, and if I had I wouldn't let you have it until you paid me what you borrowed two months ago."

His friend will never call him back again in a public dining room.—*Dublin Irish Times.*

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Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

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The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



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Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

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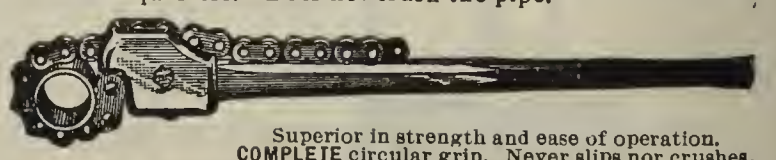
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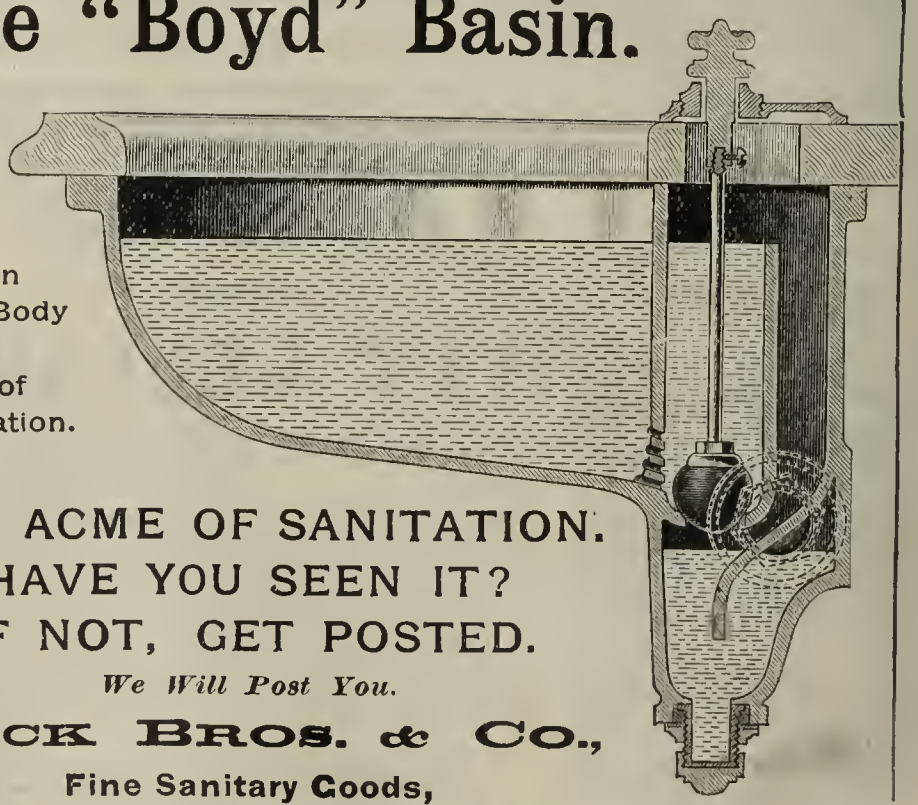


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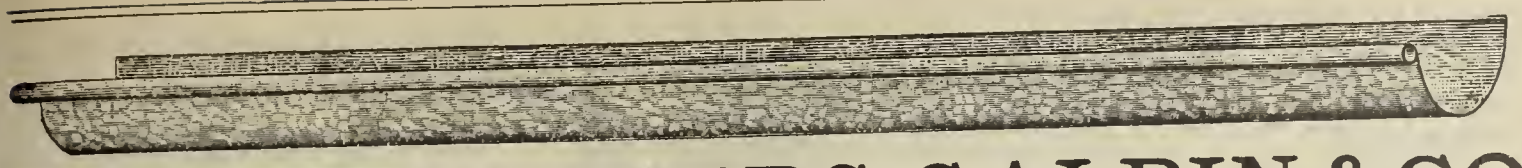
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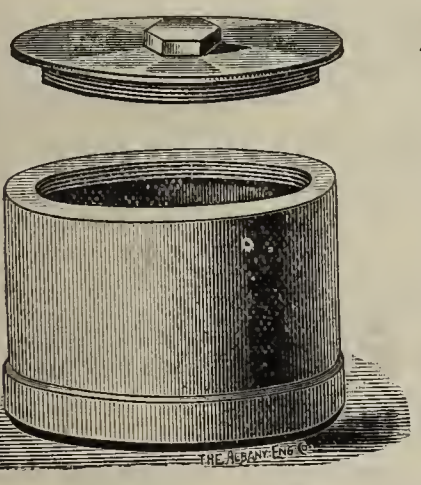
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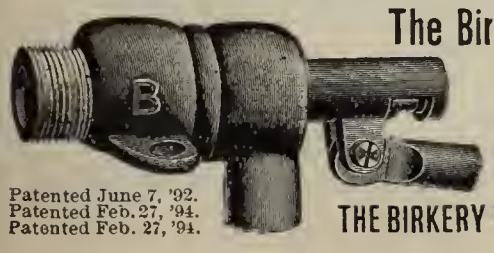
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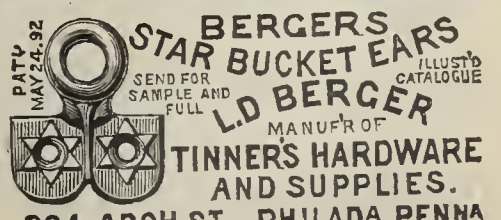
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It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

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3-inch sample, by mail, 40 cts. in stamps.
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For Family Oil Cans, Etc.

(Patent applied for.)



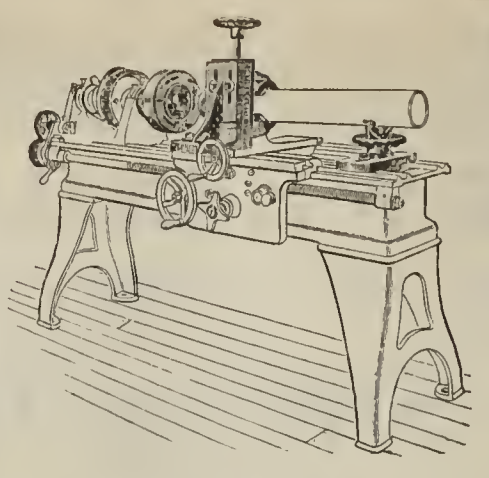
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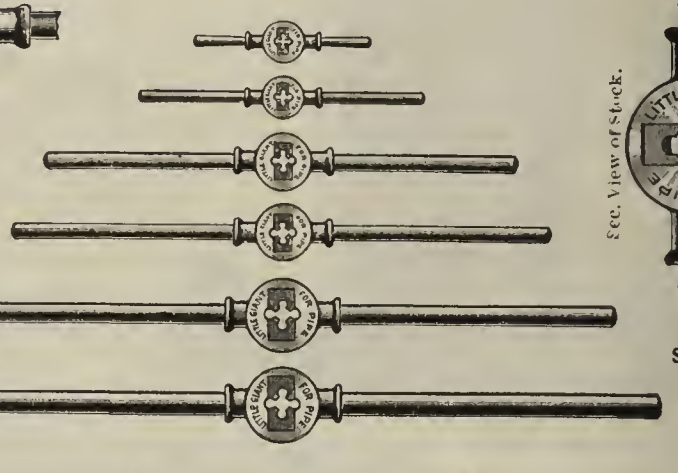
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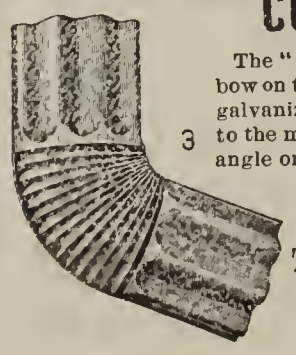
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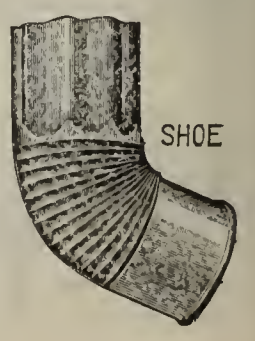
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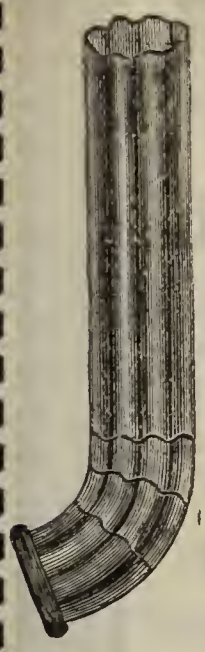
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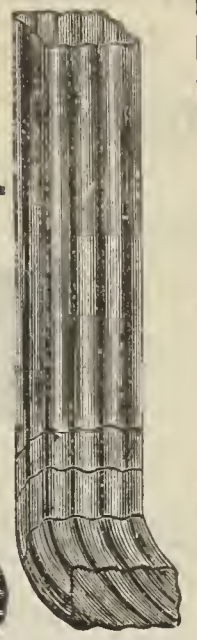
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The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

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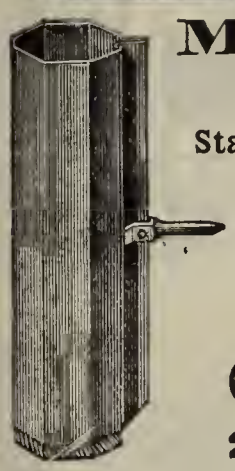
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EAVE TROUGHS

With Detachable Couplings.

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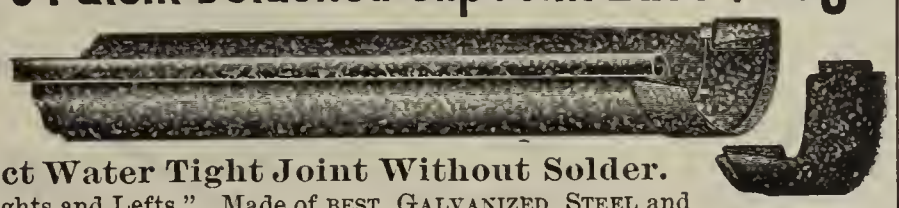
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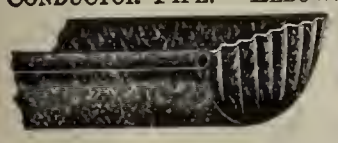
Holton's Patent Detached Slip Joint Eave Trough.

10 FEET LONG.



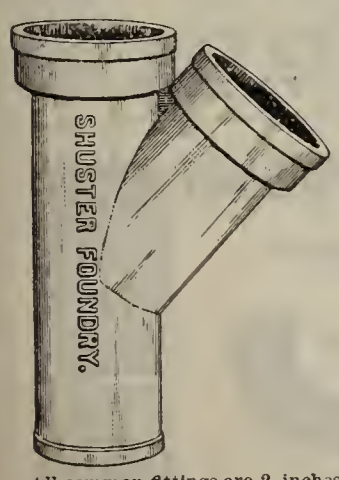
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6 x 6 to 6 x 2 inclusive.
5 x 5 to 5 x 2 "
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Price-List on Application.

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PATENT

EXPANDING WATER CONDUCTOR

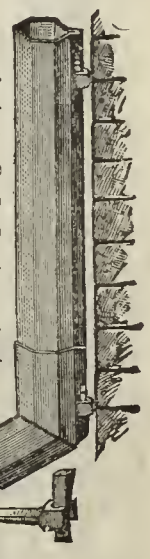
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THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

Galvanized, Kalameined or Leaded.

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The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.

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IMPROVED CORRUGATED

Expanding Conductor.

ALSO

Stamped Corrugated Elbows & Shoes.



No. 3 SHOE.

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Self-Acting Frost-Proof

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For Extreme Cold Places and Out of Door Work.

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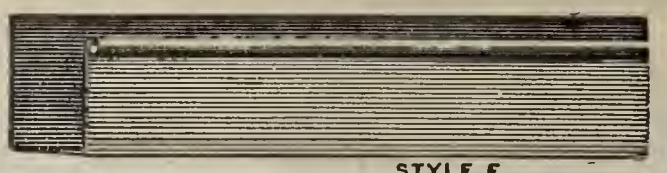
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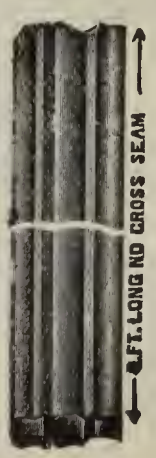
Patent Eave Trough and Hangers, Conductor Pipe, O. G. and Box Gutters, Ridge Roll and Capping, Ventilators, Finials, Cresting.

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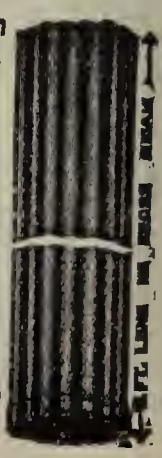
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Corrugated Expanding Conductor

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The Only Absolutely

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Send for our descriptive pamphlet, it contains information of value to the trade.

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Bright and Roofing.

MANUFACTURED BY

The Cleveland Tin Plate Co.,

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ÆTNA-STANDARD IRON & STEEL CO.,

Successors to Ætna Iron and Steel Co., and The Standard Iron Co.,

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PLATES and SHEETS, BLACK, GALVANIZED and CORRUGATED Plain Roofing, Siding and Ceiling, also of Sheet Steel for special purposes, Cold Rolled or Plain and Patent Leveled.

BARS, LIGHT SECTION RAILS, ANGLES, TEES and CHANNELS, odd sections and sizes, Machine Straightened Steel Tire, Ordinary Shafting, Horse-Shoe Bars, Ax-Poll Steel, Toe Calk, Nut, Bolt and Chain Rods, and other special Bars suited to every requirement.

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Means "at length," hence we adopt the brand "TANDEM" for our **continuous roofing tin,** which is entirely unlike any other coated continuous roofing :

1st. The sheets are 96 inches long.
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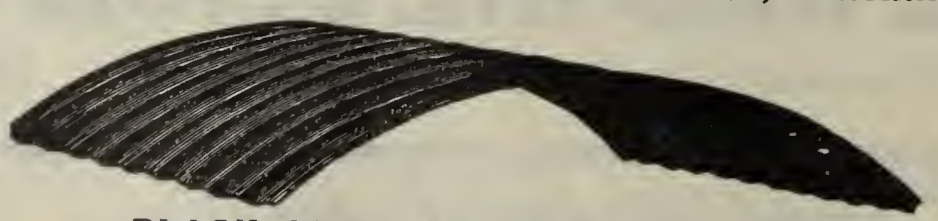
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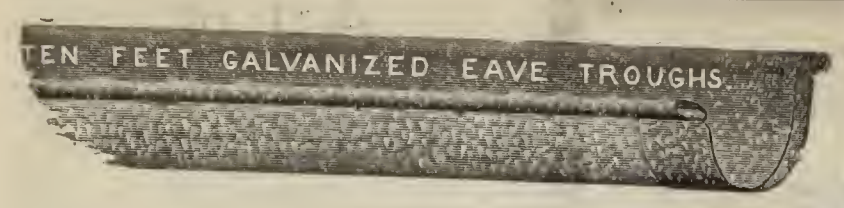
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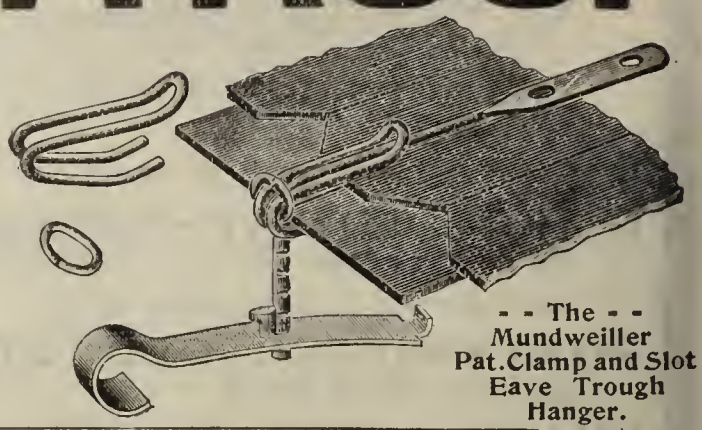
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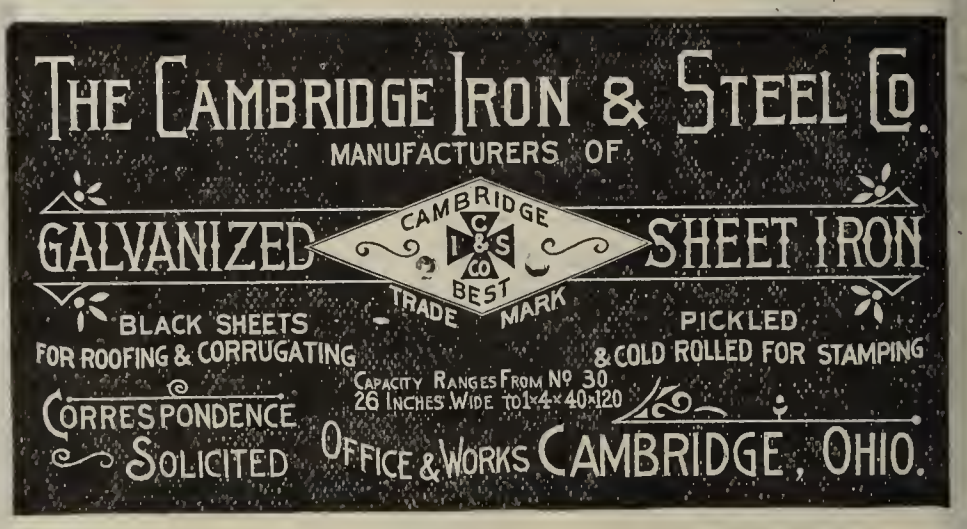
"I become hollower year by year," ventured the main tube.

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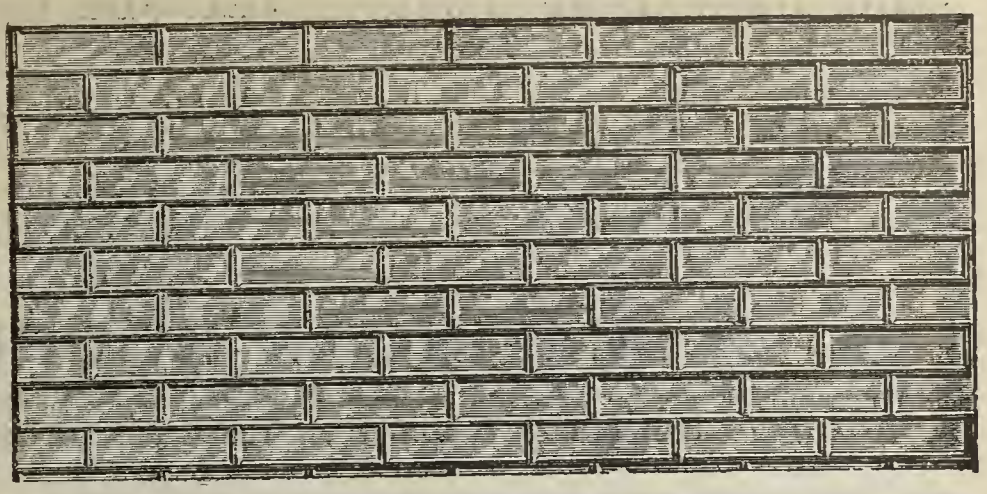
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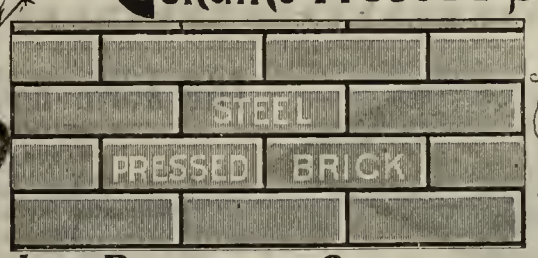
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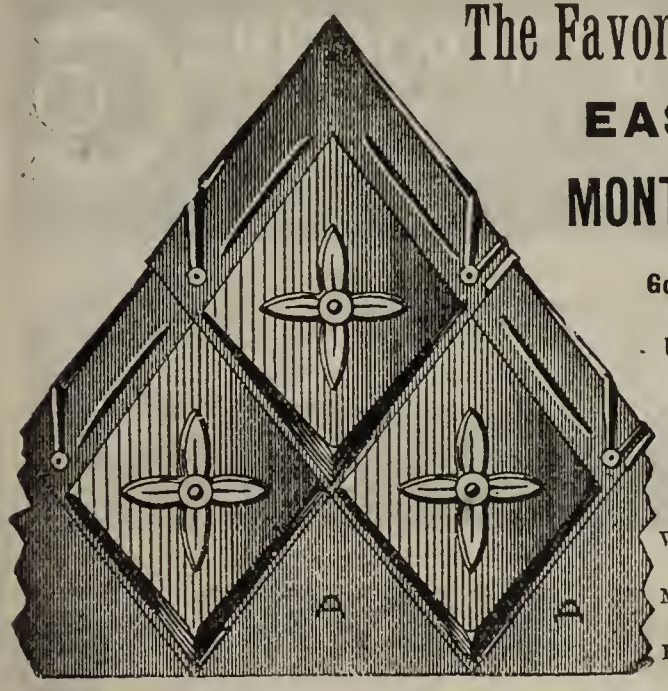


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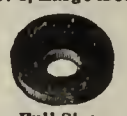


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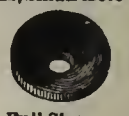


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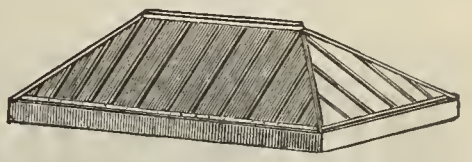
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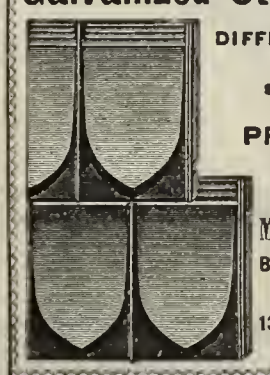
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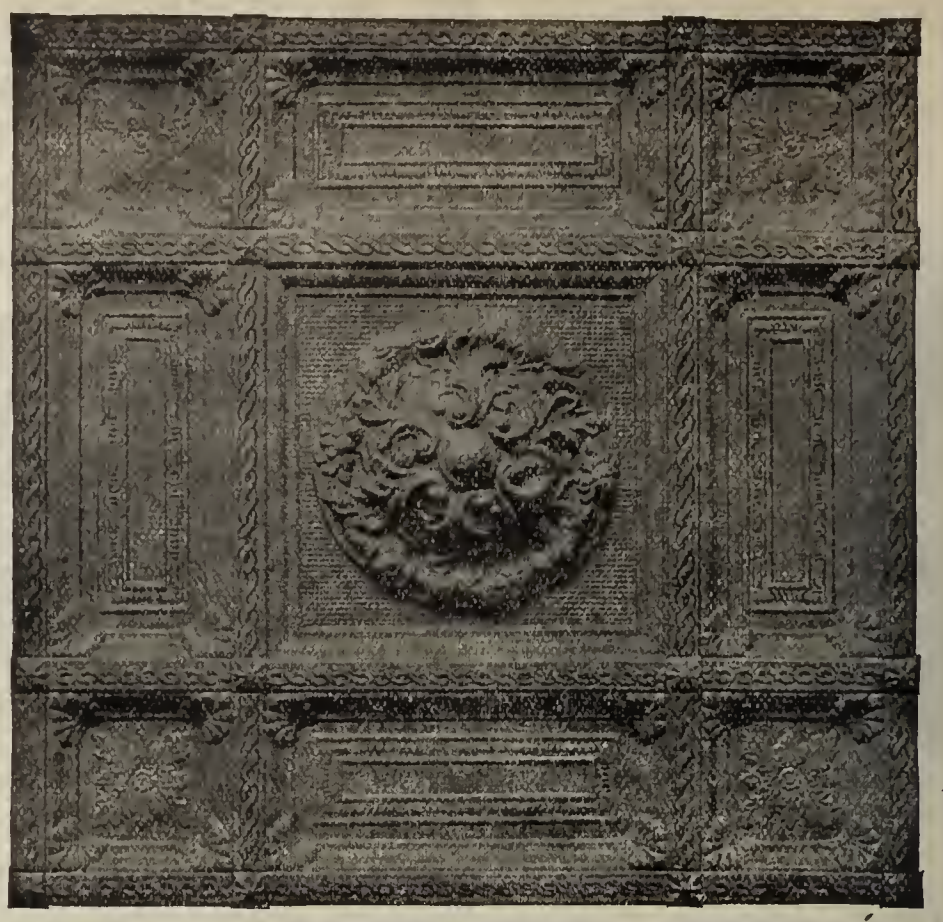
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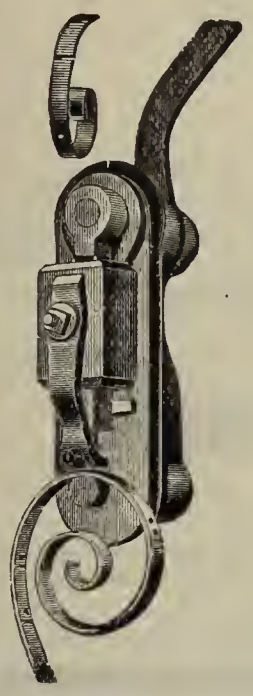
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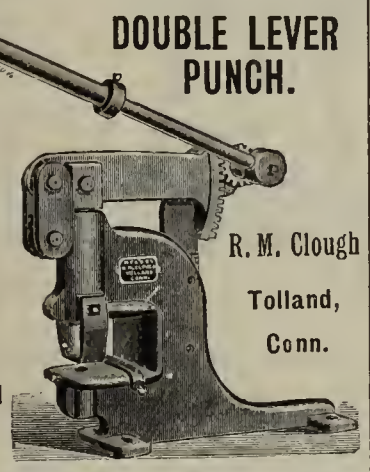
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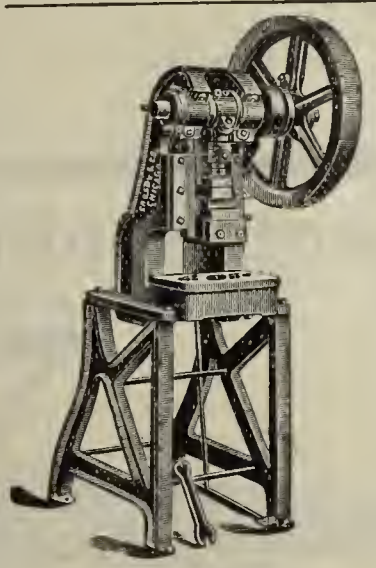
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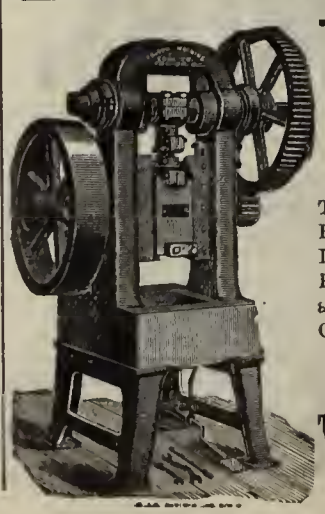
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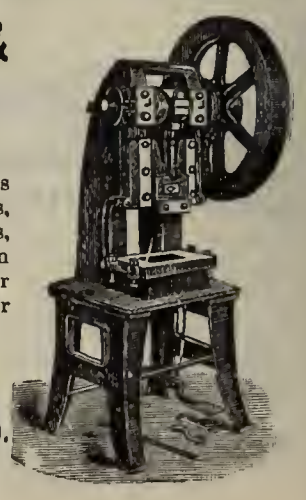
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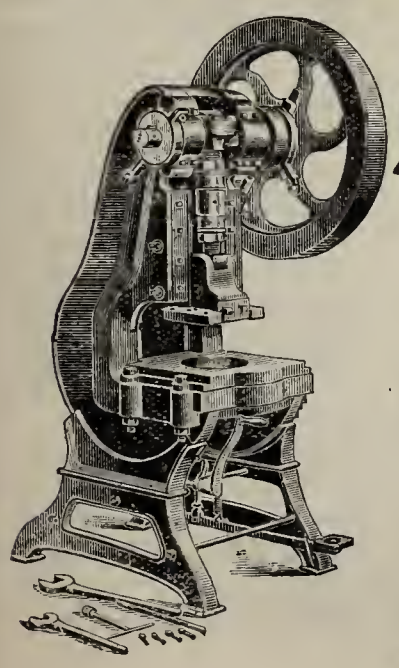
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Deming Co., Salem, O.
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Myers, F. E. & Bro., Ashland, O.

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Clough, R. M., Tolland, Conn.
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Eckstein, Chas. G. & Co., 41 John St., N. Y.
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Columbia Roofing Co., Canton, O.
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Dover Machine Works, Dover, Del.

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Indianapolis Elbow Co., Indianapolis, Ind.
Keene, Geo. C. & Co., Cincinnati, O.
Michigan Stove Co., Chicago, Ill.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
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Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co. Toledo, O.

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Cincinnati Stamping Co., Cincinnati, O
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugatiug Co., Phila., Pa.
Van Noorden, E. & Co., Boston, Mass.

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Colwell Lead Co., 63 Centre St., N. Y.

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Galt, Jno. & Sons, 52 John St., N. Y.
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Halliday, M., East 9th St., N. Y.

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Dixon, Jos. Crucible Co., Jersey City N. J.
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Yates & Co., Rockford, Ill.

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Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.

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Calely, Edw. L., Philadelphia, Pa.
Cincinnati Pattern Wks., Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobielle Pattern Co., Cleveland, Ohio.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Ruth, Patterson & Ruth, Alliance, O.

Stove Pipe Thimbles.

Bretch, A., Dayton, O.
Cheney, S. & Son., Manlius, N. Y.
Stearns, E. C. & Co., Syracuse, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.

Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., City.
Troy Nickel Works, Troy, N. Y.

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Chicago & Erie Stove Co., Erie, Pa.
Dippo Mfg. Co., Chagrin Falls, Ohio.
Eclipse Stove Co., Mansfield, Ohio.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., Chicago, Ill.
Michigan Stove Co., Chicago, Ill.
Raymond & Campbell Mfg. Co., Middletown, Pa.
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Stamford Foundry Co., Stamford, Conn.
Taplin, Rice & Co., Akron, O.
Western Stove Mfg. Co., St. Louis, Mo.

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Milwaukee Gas Stove Co., Milwaukee, Wis.

Stoves and Ranges, Oil, Vapor and Gasoline.

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Glazier Stove Co., Chelsea, Mich.
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Lyon, Conklin & Co., Baltimore, Md.
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Moorhead-McCleane Co., Pittsburgh, Pa.
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Osborn, J. M. & L. A., Cleveland, Ohio.
Philadelphia Tin Plate Co., Phila., Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
U. S. Iron & Tin Plate Mfg. Co., Demmler, Pa.
Wheeler, E. S & Co., New Haven, Ct.

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Curtis & Curtis, Bridgeport, Conn.
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Trimont Mfg. Co., Roxbury, Mass.
Wells Bros. & Co., Greenfield, Mass.

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Bruce & Cook, 186 to 190 Water St., N. Y.
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Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York
Ridgway & Wilkinson, Boston, Mass.
Rothweiler, W. J., Pittsburgh, Pa.
Ruth, Patterson & Ruth, Alliance, O.
Stark Machine & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn. N. Y.
Wheeler, E. S. & Co., New Haven, Ct.

Traps and Vents.

Shuster's Foundry, Philadelphia, Pa.

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Jenkins Bros., 71 John St., N. Y,
Mason Regulator Co., Boston, Mas

Ventilators and Chimney Caps

Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa

Wash Boards.

Olds Wagon Works, Ft. Wayne, Ind.

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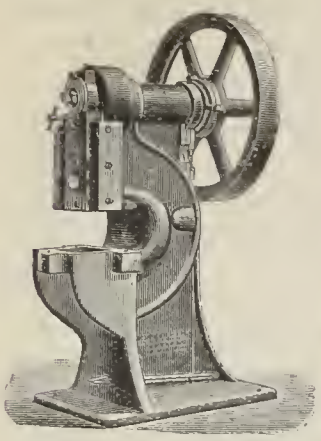
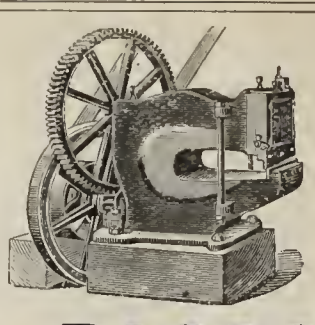
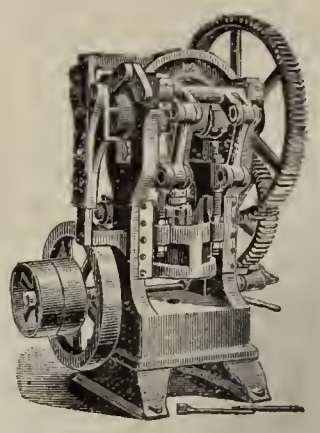
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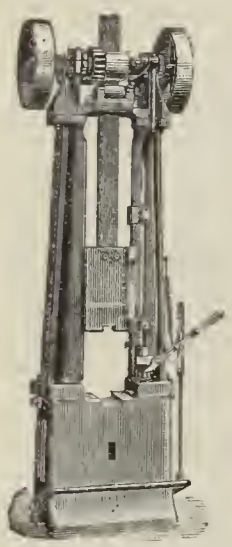
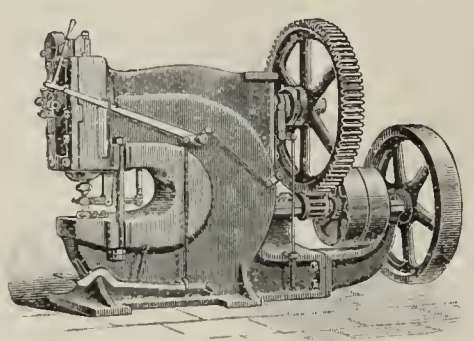
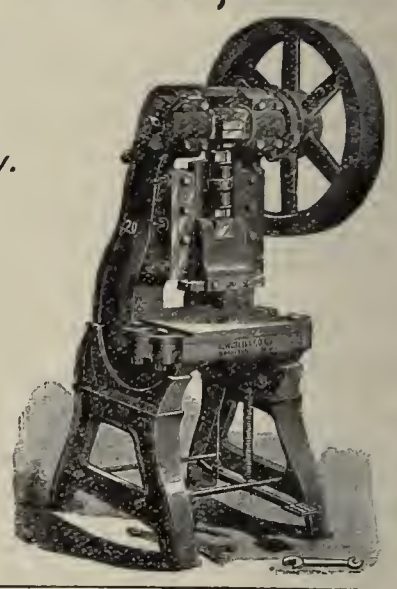




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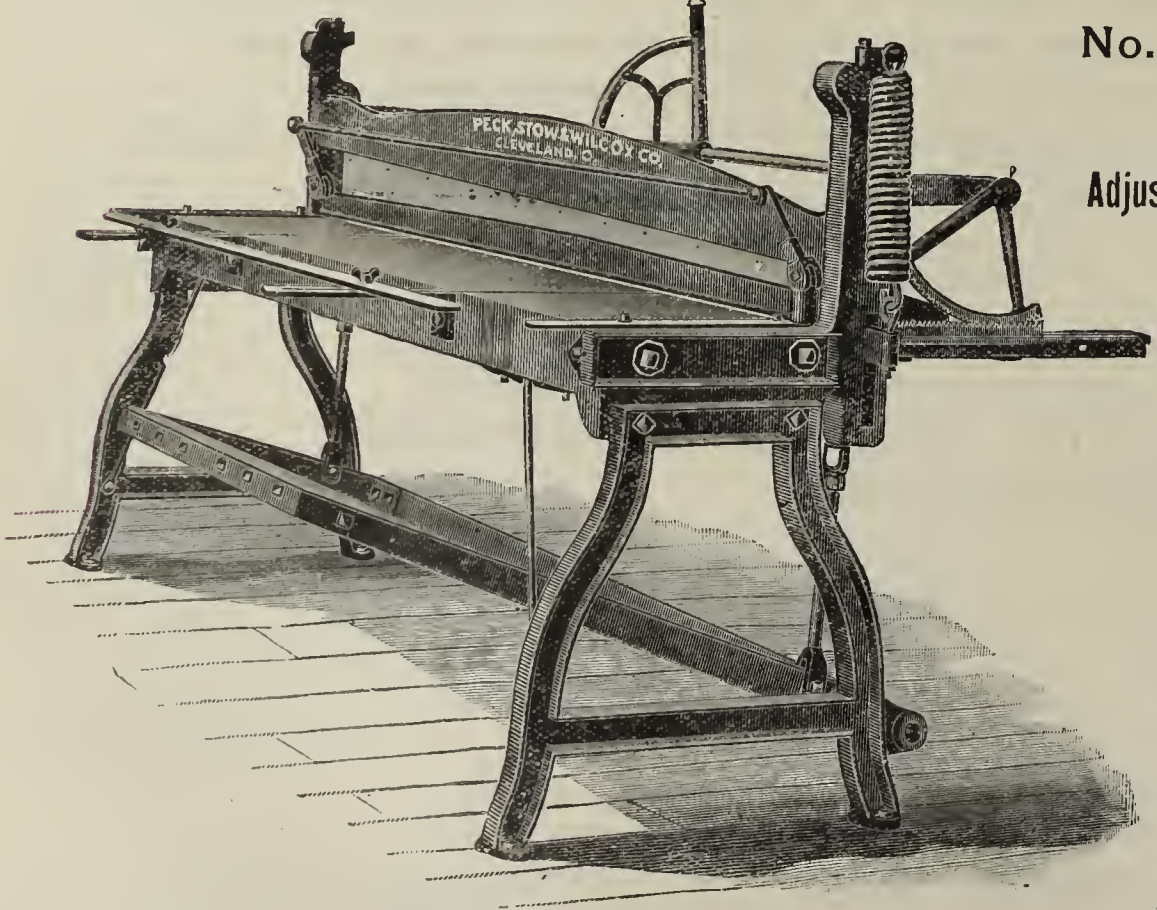




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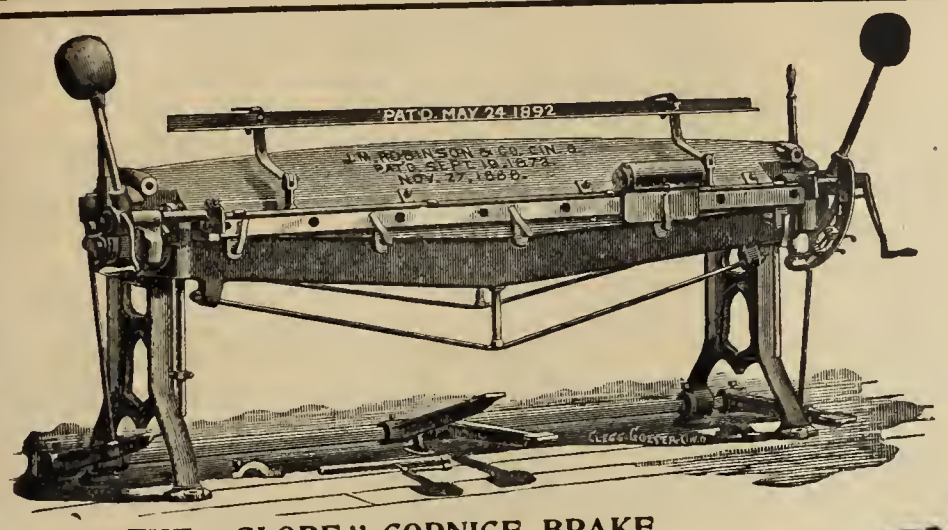
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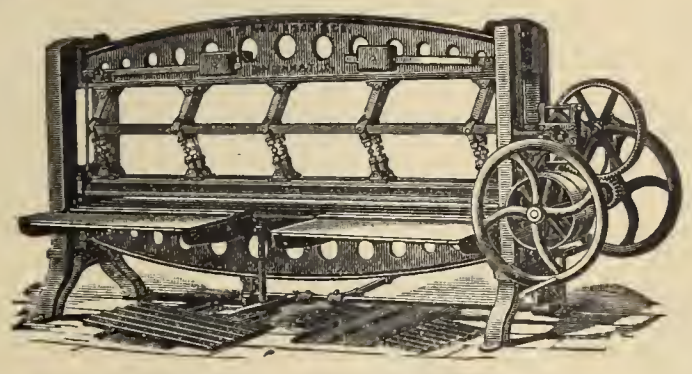


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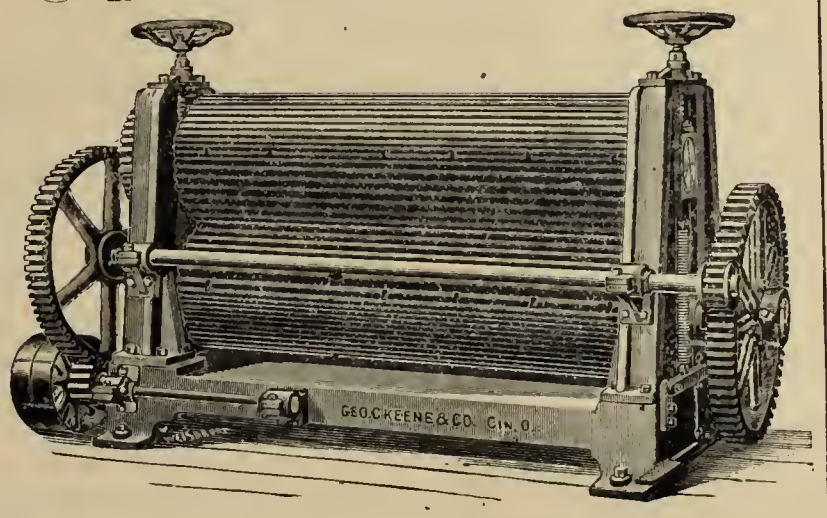
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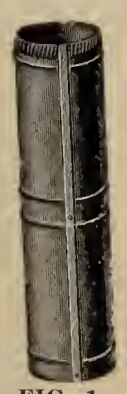


FIG. 1

FIG. 2.



FIG. 3.



FIG. 4.

Fig. 1. Represents pipe set up and is perfectly smoke tight.
Fig. 2. Represents an end view of pipe and shows construction of seam.
Fig. 3. Represents top of joints spread and packed for shop or domestic use.
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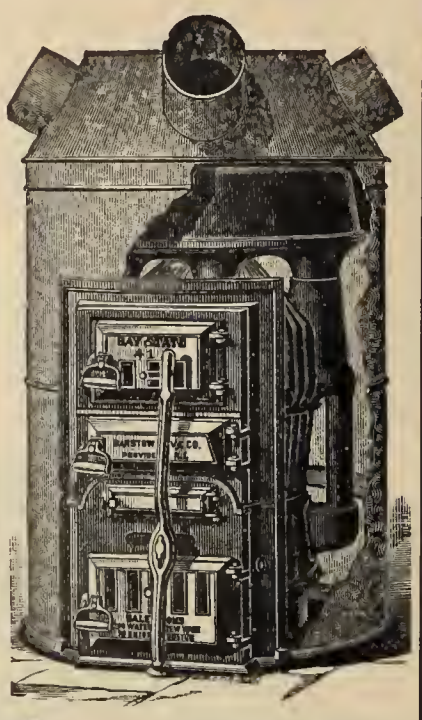
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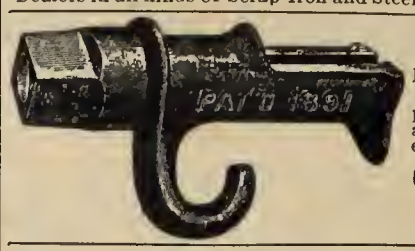


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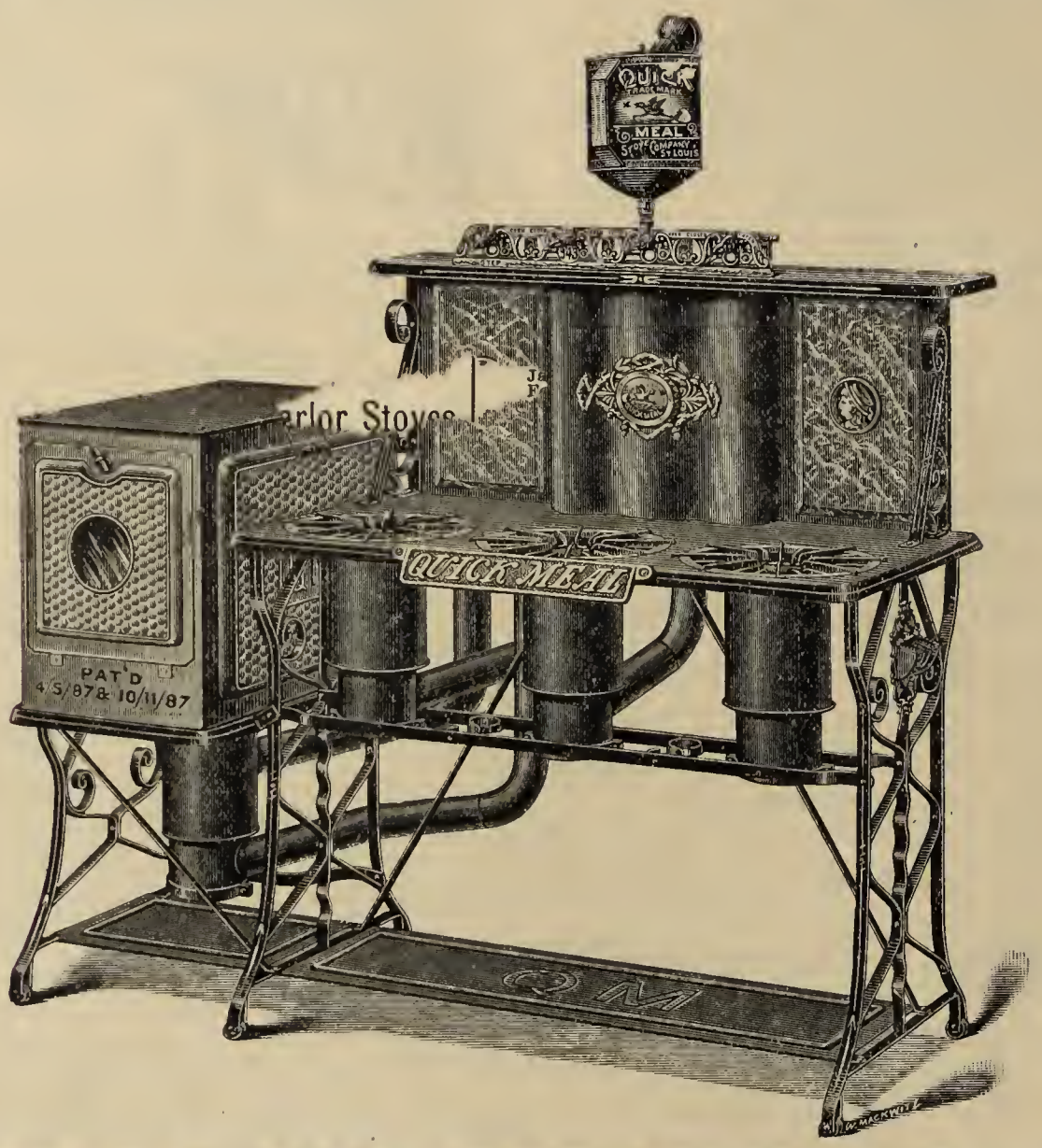
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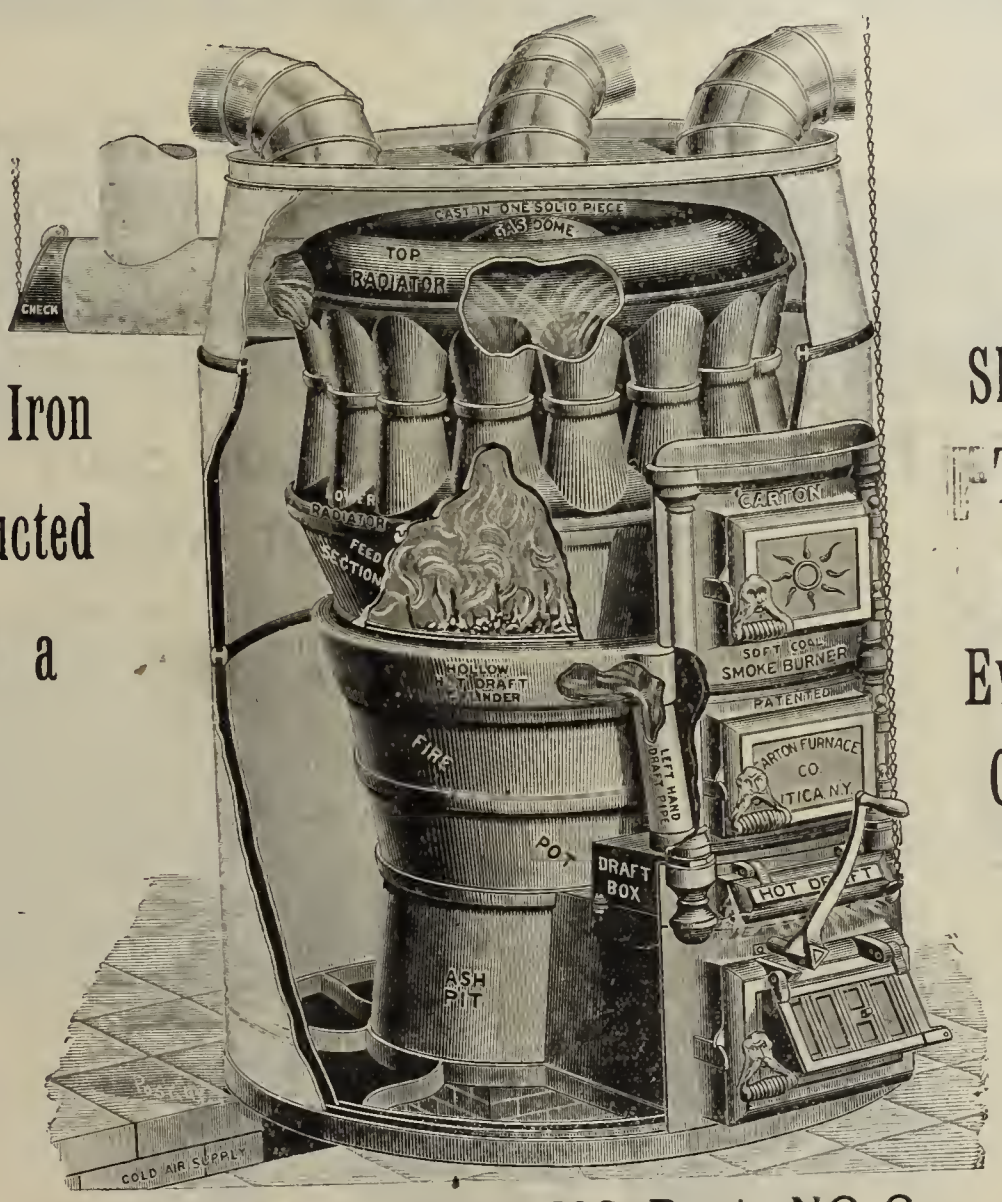
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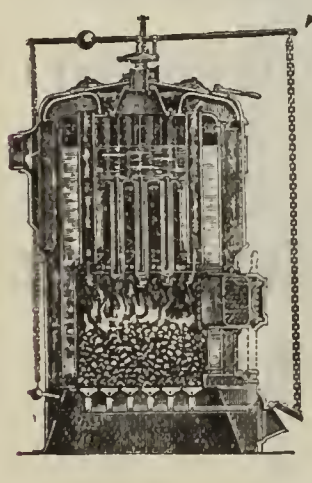
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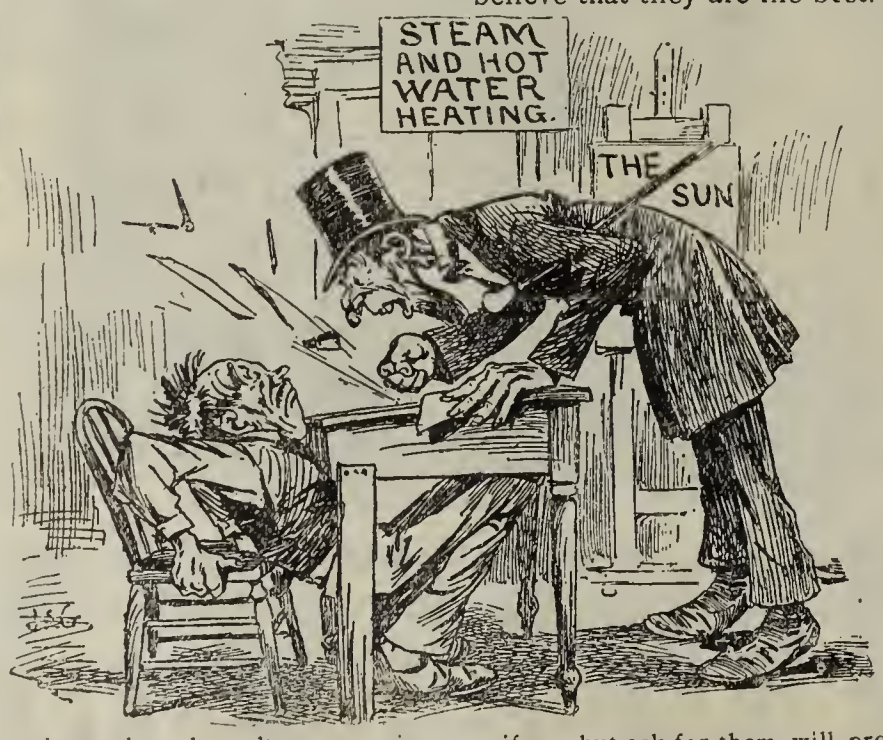
SYRACUSE, N. Y.

GEO. D HOFFMAN, - 82 LAKE ST., CHICAGO.
228 Franklin Street, Boston. 1640 No. 3d St., Harrisburg.
181-3-5 Queen Street, E., - - - - Toronto, Ont.



The Lindemuth Steel Sun Steam AND Hot Water Boilers

Do not need a forced argument to make the trade believe that they are the best. . . . . .



The Testimonials of their action and good results we can give you, if you but ask for them, will prove that the above is a fact. Write for prices and discounts.

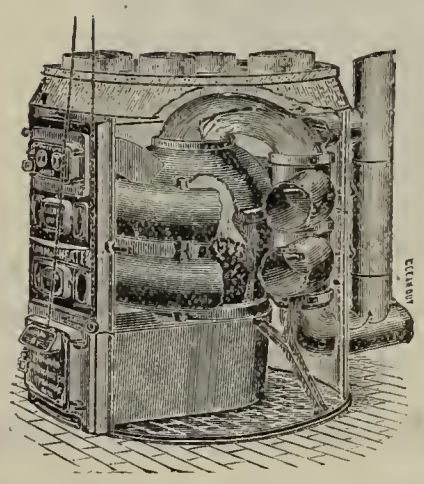


MANUFACTURED BY **The Raymond & Campbell Mfg. Co.,**

Main Office and Works, Middletown, Pa.
New York Store and Warehouse, No. 244 Water St.
Boston Agency, No. 4 Oliver Street.
Philadelphia Agency, No. 45 N. Seventh.
Cleveland Agency, No. 1463 Willson Avenue.
Washington Agency, No. 1237 Ninth St., N. W.
Chicago Agency, No. 229 E. Van Buren Street.
Columbus, O., Agency, No. 106 N. High Street.

HOWARD FURNACES

CHALLENGE COMPARISON



THIS HEATER IS "INDIRECT DRAFT" FROM INCEPTION TO FINISH AND IS CAPABLE OF PRODUCING THE GREATEST AMOUNT OF HEAT WITH THE LEAST AMOUNT OF COAL.

Main Office and Works at Syracuse, N. Y.

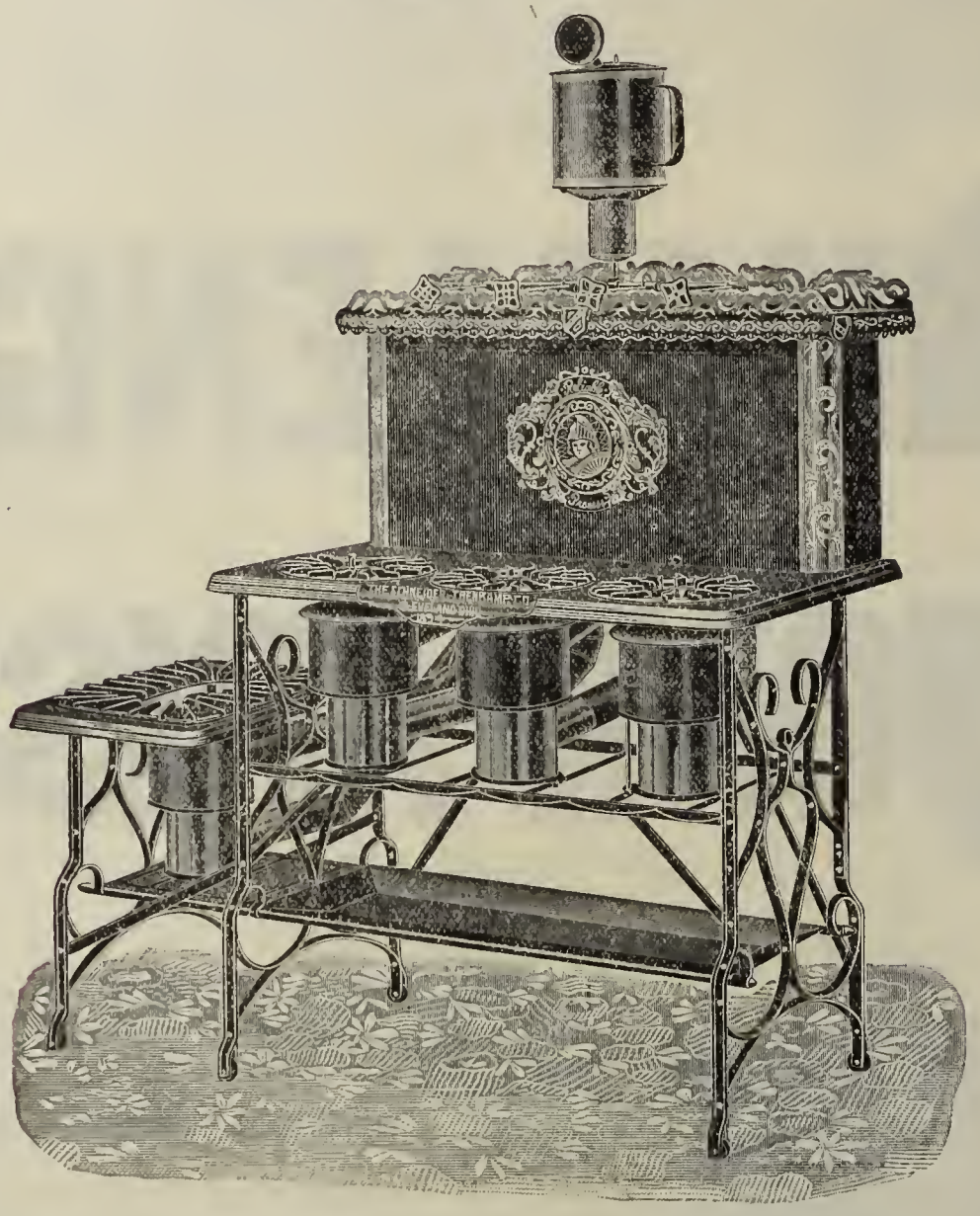
HOWARD FURNACE CO.,

New York, Boston, Grand Rapids, Toronto.

RELIABLE

Gasolene Stoves.

IMPROVED FOR 1894.



If you have not received our NEW ILLUSTRATED CATALOG write for one. We make the largest, most complete line, and make and sell more Gasolene and Gas Stoves than any other concern.

76,807 COMPLETE STOVES SOLD IN 1893.

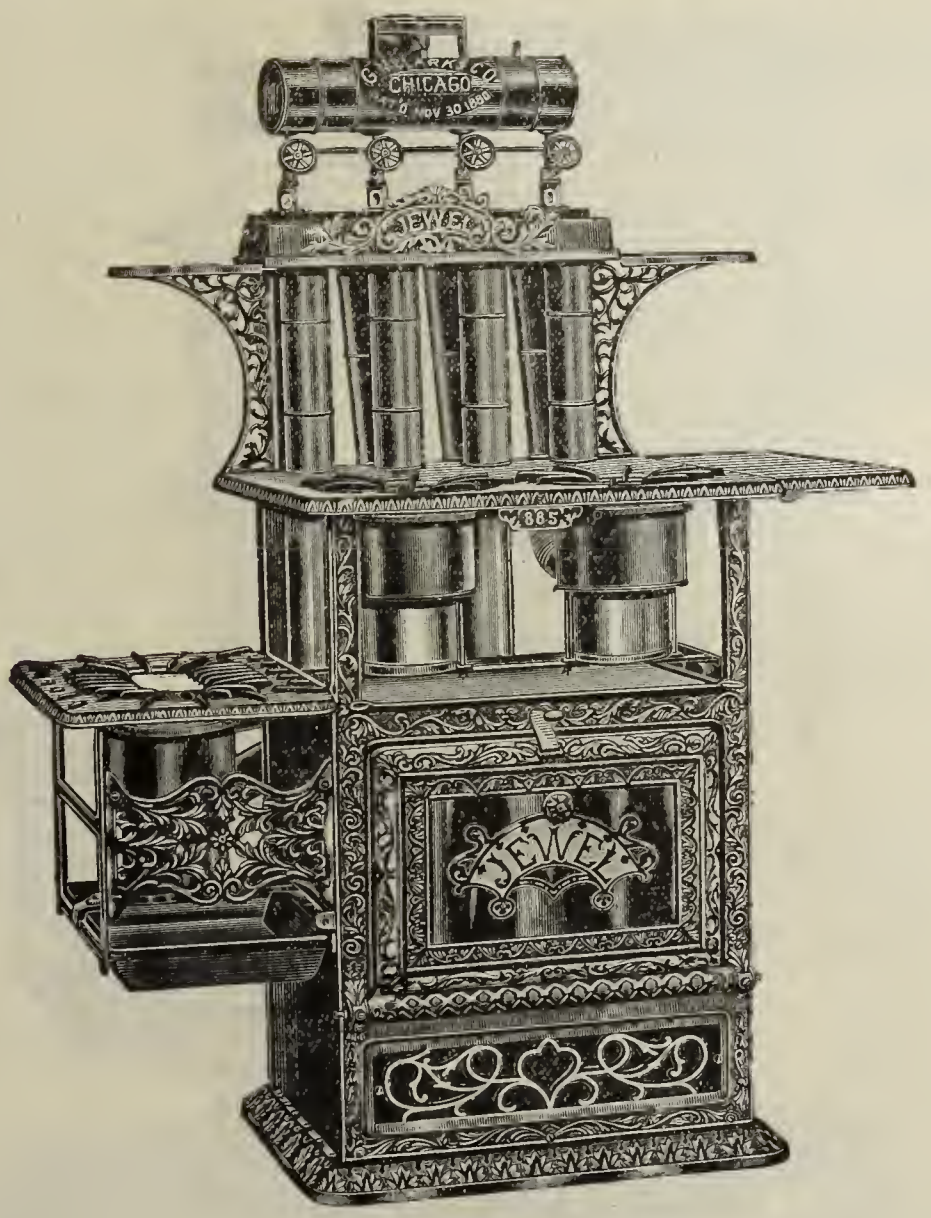
THE SCHNEIDER & TRENKAMP CO.,

CLEVELAND, OHIO.

AGENTS:

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E. H. HUENEFELD, Cincinnati, O.—Southern Ohio, Southern Indiana, Southern Illinois States of Kentucky and West Virginia.
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WM. LYLE DICKEY & CO., Omaha, Neb.—Wholesale Agents for State of Nebraska.
A. L. WEST, Des Moines, Ia.—State of Iowa.
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LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo., Kansas City Kas., Argentine and Armourdale.
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THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Florida, Georgia, Alabama, Tennessee (excepting Knoxville and Chattanooga) and North and South Carolina.
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JEWEL
Process Stoves
ARE UNEQUALED.



Because of a record of not one imperfect or returnable stove.

Write for Catalog showing 46 Stoves.
It may save you many dollars.

George M. Clark & Company,

Makers,

149=161 Superior Street, CHICAGO.

SPECIAL AGENTS:

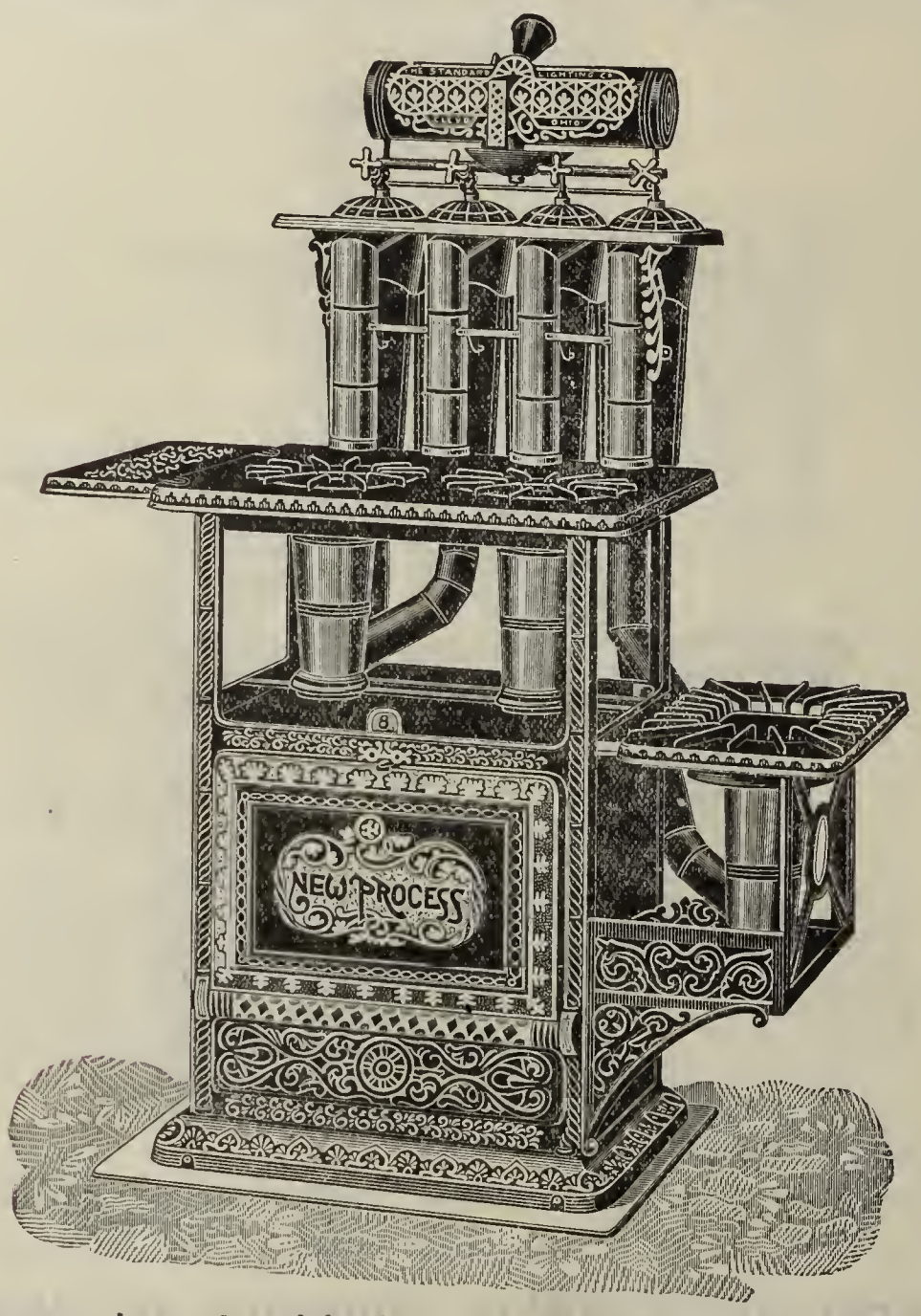
GREAT WESTERN STOVE CO., Leavenworth, Kan.
W. W. MONTAGUE & CO., San Francisco, Cal.
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COOKING MADE EASY.

Success the Proof of Merit!

Over a Quarter Million "New Process" (evaporating) **Stoves in use in the United States.**



For 1894 equipped with brass hot air pipes, improved sight feed, removable drip valves with anti-rusting points, **cleanable reservoir** and handsome steel oven, Russia iron finish, asbestos lined. The best baker made!

THE STANDARD LIGHTING CO.,

CLEVELAND, OHIO.

WHOLESALE AGENTS FOR THE SEASON OF 1894:

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BRIDGEFORD & CO., Louisville, Ky.
H. LEONARD & SONS, Grand Rapids, Mich.
TOWNLEY STOVE CO., Terre Haute, Ind.
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KNAPP & SPALDING CO., Sioux City, Iowa
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GAS

Monarchs



Are no experiment, but all that the best inventive **genius** backed by indomitable enterprise could make them.

The perfection of artistic design, mechanical ingenuity, together with their great excellence, truly entitles them to be called "Monarchs." Dealers in cities where gas is consumed will do well to examine this line and secure the agency.

The Baxter Stove Co.,

MANSFIELD, OHIO.

Agencies for New York, New Jersey, Pennsylvania and New England States,

THE DANVILLE STOVE & MFG. CO., Danville, Pa,

AND 284 PEARL STREET, NEW YORK.

ARMSTRONG STOVE & MFG. CO., Baltimore, Md.
E. H. HUENEFELD, No. 25 East 9th Street, Cincinnati.
CHAS. R. McADAMS, Ft. Worth, Texas.
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THE ZAHNER & BATTELL MFG. CO., Kansas City, Mo.
THE HALL BROS. CO., Lincoln, Neb.
THE COOK RANGE & STOVE CO., No. 173 Lake Street, Chicago.
MR. G. W. CAHOON, No. 12 East 3d Street, St. Paul.
McCLARY MFG. CO., Agents for Canada and British Columbia.

MILWAUKEE GAS STOVE CO.,

OFFICE AND WORKS: 15 and 17 Erie Street - MILWAUKEE, WIS.

OUR LEADER FOR 1894.

Features.

Adjustable valves.
Superior in design.
Excellent in workmanship.
Cleaning burner attachment.
Great efficiency in doing work.
Extreme economy in gas consumption.

The drop door, unlike those on other ranges, is entirely new, simple and durable.



OUR CATALOGUE AND DISCOUNT SHEET ON REQUEST.

Our Goods are Superior in Quality of Material used and in Workmanship.

WILL MEET THE DEMAND.

We offer this line on its merits, coupled with the fact that its price is about one-quarter below any gas range heretofore offered by us.

We carry a full line of Heaters and Gas Grates.

Manufacturers of

Gas Stoves and Ranges,
Fire Places and Heaters
Laundry Heaters,
Hatters' Iron Heaters,
Ovens, Hotel Ranges.
Kilns for Firing China,
Kilns for Firing Glass,
Melting Furnaces,
Coffee Roasters,
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SALESROOMS AND WAREHOUSES, { NEW YORK CITY, N. Y., AND CHICAGO, ILL.

SALESROOMS ONLY, { SAN FRANCISCO, CAL., AND PORTLAND, OREGON.

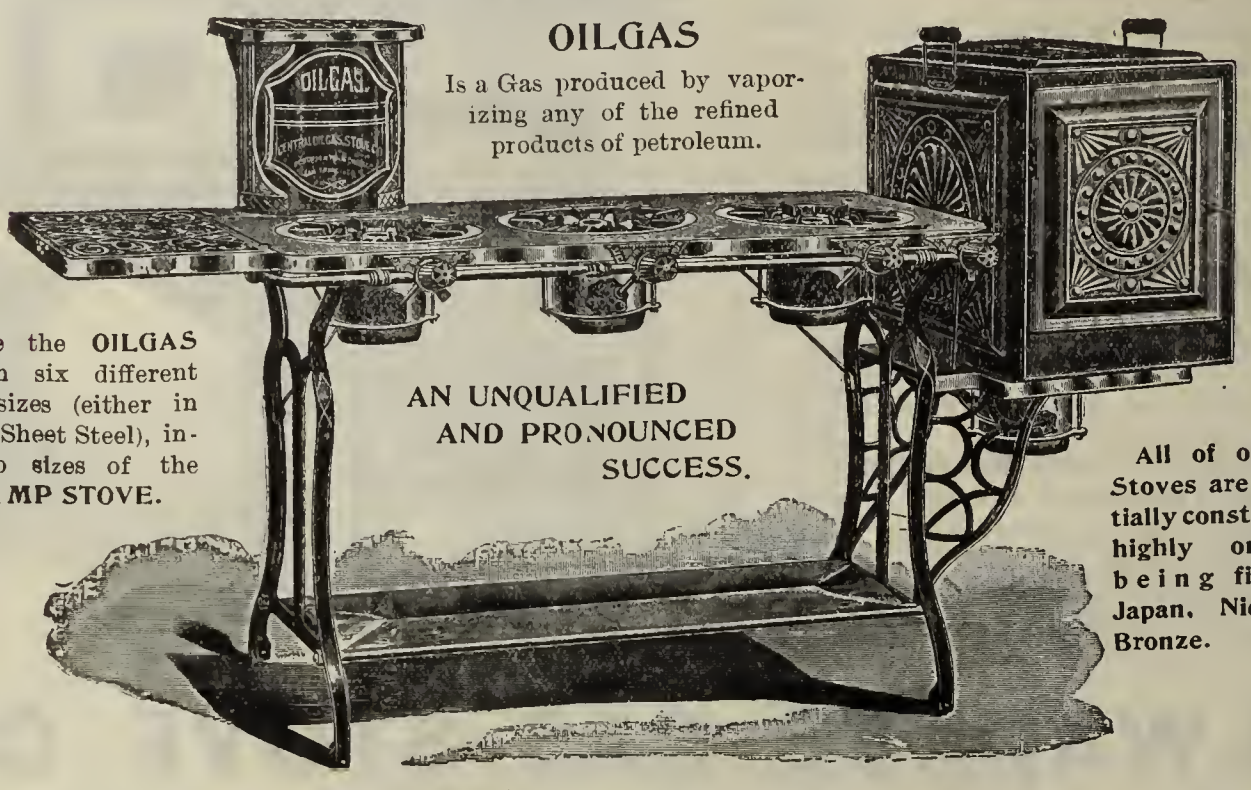
OILGAS

HAVE YOU SEEN OUR IMPROVED OILGAS BURNER FOR 1894?

THE ONLY KEROSENE VAPORIZING OIL STOVE IN THE WORLD, AND THE BEST GASOLENE STOVE EVER CONSTRUCTED.

OILGAS

Is a Gas produced by vaporizing any of the refined products of petroleum.



We make the **OILGAS STOVES** in six different styles and sizes (either in Cast Iron or Sheet Steel), including two sizes of the **OILGAS LAMP STOVE.**

AN UNQUALIFIED AND PRONOUNCED SUCCESS.

All of our Vapor Stoves are substantially constructed and highly ornamental, being finished in Japan, Nickel and Bronze.

This cut practically represents our Three Burner and Step Oilgas Cook Stove, showing the burner with a section of the outside jacket removed, presenting a view of the outside perforated burner wall, also showing Feed Pipe and hole in the burner for lighting.

We have in this burner everything that could possibly be desired in a burner.

1st. SIMPLICITY

2d. DURABILITY.

3d. Vaporizing ordinary kerosene oil in less than one minute from the time of first applying match.

4th. Producing a perfect blue vapor flame of intense power.

5th. Vaporizing gasolene in 10 seconds from the time of first applying match and producing and maintaining a purer and more powerful flame than any other gasolene vapor stove in existence.

Note only one of the many advantages that this stove has over any other vapor stove ever produced. **You can burn either kerosene or gasolene** with perfect impunity and at pleasure and **with the same satisfactory results.**

Any enterprising dealer who will push the sale of this stove **can make more money** than he has ever heretofore dreamed of making out of the sale of oil or vapor stoves.

That our Oilgas Cook Stove is a pronounced success in the hands of every intelligent user is more than ever assured by the rapid increase in our sales and the glowing testimonials that we are daily receiving from those who have used the stove during the past season.

Less than two years ago we first introduced our Oilgas Cook Stove to the public. It has grown in popular favor since the very day of its first introduction.

We are the only manufacturers in the world of an Oil Vaporizing Stove and the largest manufacturers of Oil and Gas Stoves. Over two hundred different styles and sizes for cooking and heating purposes; also miscellaneous articles, such as Nursery Burners, Glue Pot Heaters, Gas Irons for Tailors and Dress Makers, Chemical Stoves, Lanterns, Glass Oil Cans, etc., etc.

The following named **Lamp Stoves** are well and **favorably known** to the trade and public:

American, Fairy Queen, Gypsy, Sun, Champion, Florence, Iron Clad, Tom Thumb, Columbia, Globe, Monarch, Volunteer, Reliance.

For Further Information, Prices, Terms, &c., address

CENTRAL OILGAS STOVE CO.,

Boston. New York. Chicago. San Francisco.



SAM S. UTTER,

113 Beekman St., New York.

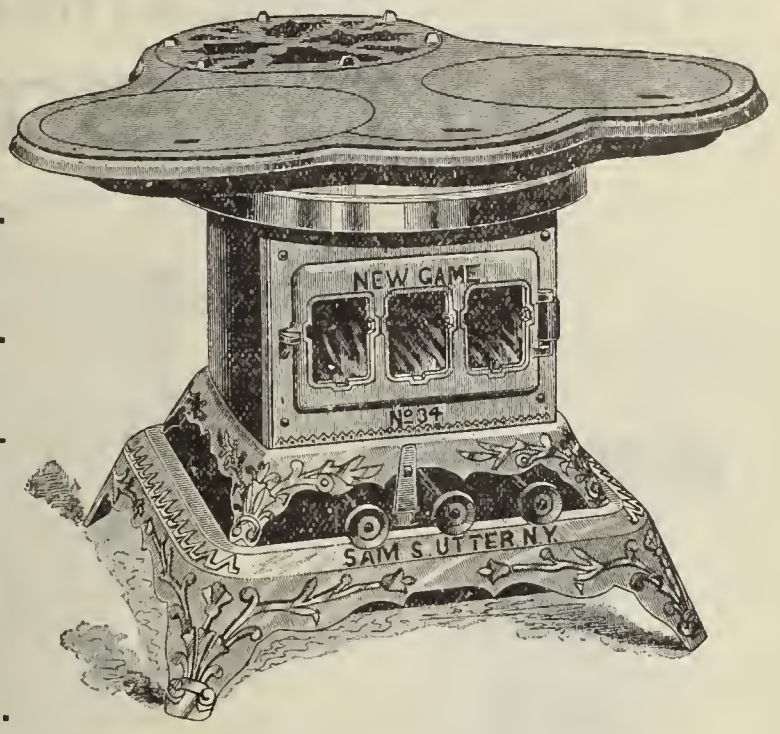
GAME
LAMP STOVE.

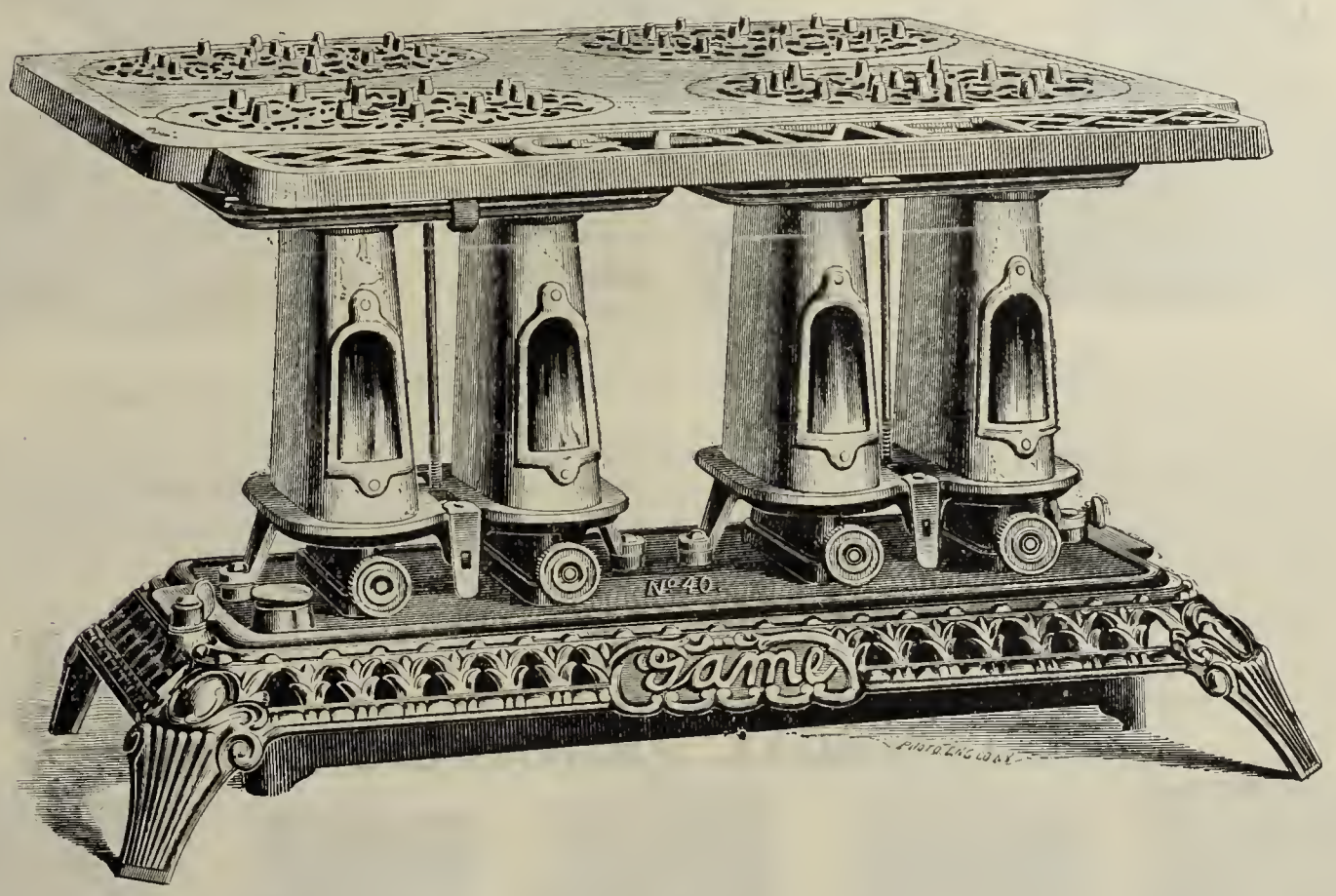
SUMMER GIRL
LAMP STOVE.

NEW GAME
OIL STOVE.
2, 3 and 4 BURNERS

GAME GAS STOVE.
1, 2 and 3 BURNERS.
IN TWO WARIETIES.

SAM S. UTTER'S
TOPS.
BASES
AND OVENS.





No. 40 ***GAME LAMP*** with 4 hole Top and Base, in Black or Nickel. Tank in one piece, not two cheap stoves put in a frame Also the Nos. 20 and 30 made in the same way. Everything I make is first class. For sale at my prices by

FREEMAN, DELAMATER & CO., Detroit, Mich.
JACOB RETTERER, 83 Wabash Ave., Chicago.
BURTIS & CO., River St , Troy, N. Y.
C. B. BAKER, Cleveland, Ohio.
MAXWELL BROKERAGE CO., Denver, Col
A. J. LINDEMANN & HOVERSON CO., Milwaukee.
O. K. STOVE CO., Louisville, Ky.

H. M. CARY, Agent for Eastern States, 35 Portland St., Boston.

SAM S. UTTER, - - NEW YORK.

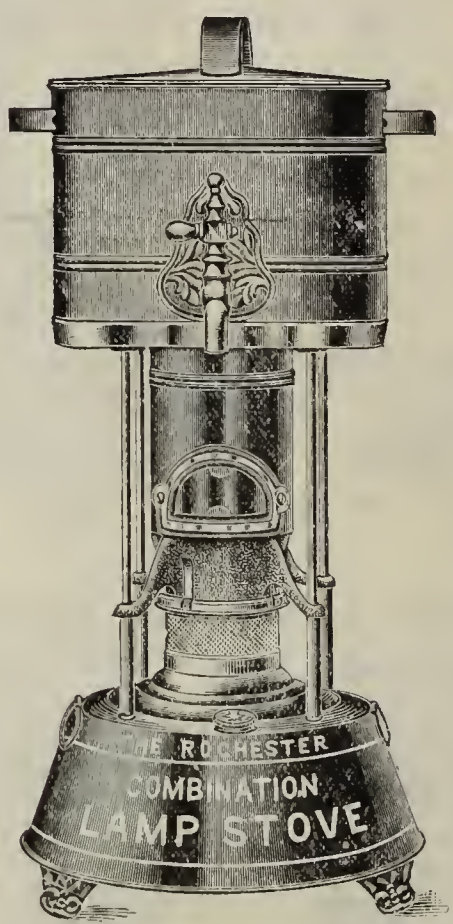
The Rochester

(CENTRAL DRAFT)

OIL STOVES.

No odor ever comes from this Stove.





Perfect combustion—equal to the finest Rochester Lamp.

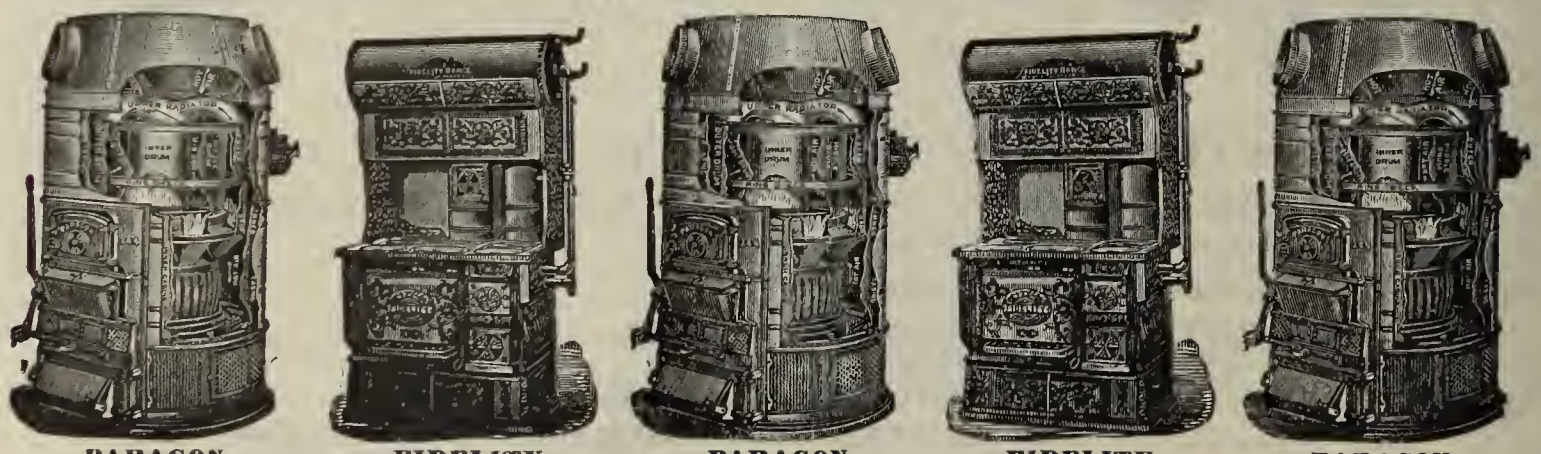


A PERFECT OIL STOVE AND COMPLETE ROCHESTER LAMP ALL COMBINED IN ONE.

This new Oil Stove was brought out last season and has had a remarkable sale. It is well known that the famous Rochester Lamp has proved to be the best lamp **EVER MADE.** This is saying a great deal, for lamps have been made and used for over 3,000 years; nevertheless it is true. Our Oil Stoves and Heaters are made on the same principle as the Rochester Lamp; have the Rochester Central Draft Burner (circular wick) with double over-cone (or perforated flame spreader). All brass burner and wick-lift. Above illustrations show No. 2 size, which **CAN BE INSTANTLY CHANGED INTO A ROCHESTER TABLE LAMP** as shown. Send for our price-list and discounts to the trade.

ROCHESTER LAMP CO., 42 PARK PLACE, 37 BARCLAY STREET, NEW YORK.

A CONTINUAL PROCESSION OF

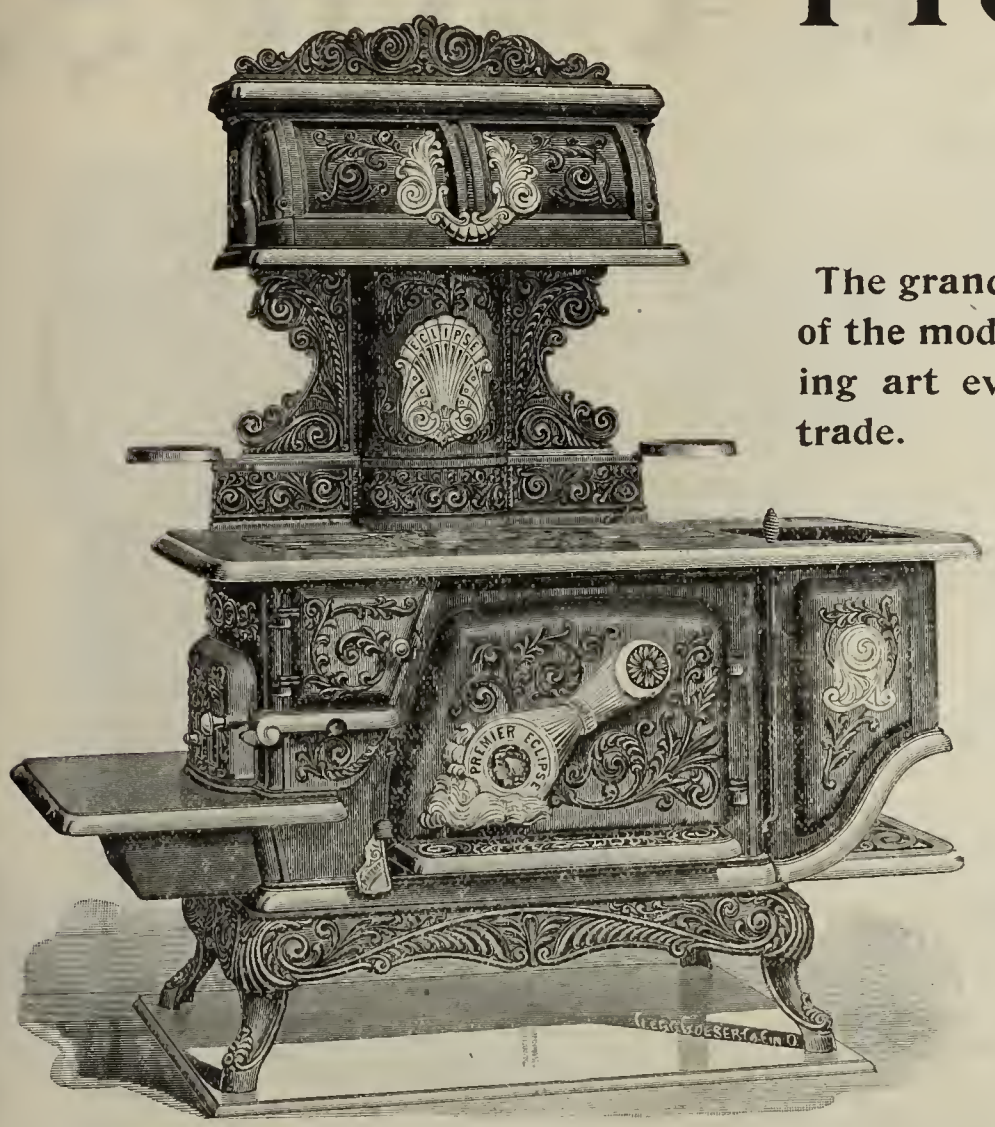


PARAGON. FIDELITY. PARAGON. FIDELITY. PARAGON.

PARAGON FURNACES and FIDELITY RANGES

Is moving steadily from our works to the homes of delighted purchasers, by way of the stores of enterprising dealers, who have found profit in aiding the course of the procession. You can get into line if you will.

Isaac A. Sheppard & Co., Manufacturers, 1801 N. Fourth St., Philadelphia, Pa.



Premier Eclipse

The grandest production of the modern stove making art ever offered the trade.

A handsome yet cheap and superior construction; sells on sight. Get our supplementary catalogue that tells all about it and send in your order for samples at once to obtain the benefit of early shipment

The Eclipse Stove Co.,

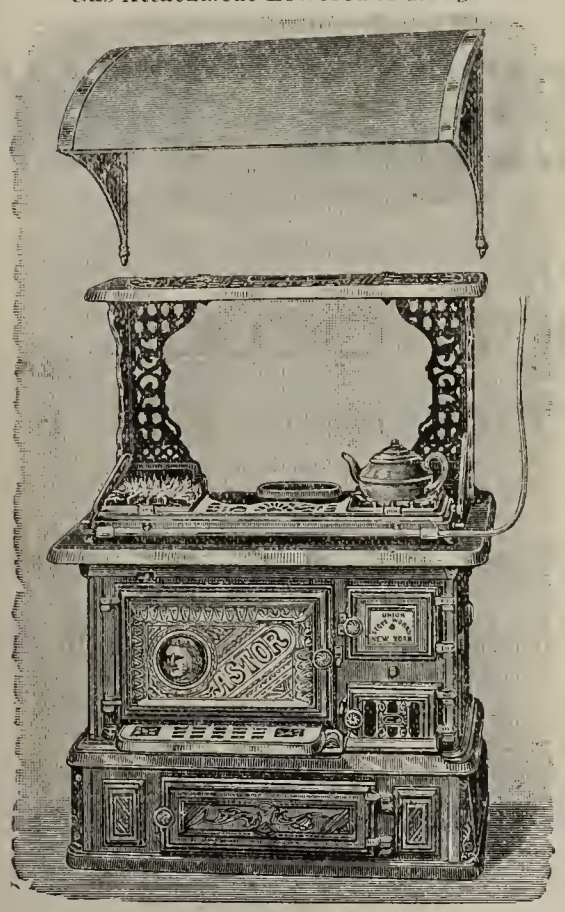
MANSFIELD, O.

NEW - PATENT - GAS - STOVE - ATTACHMENT.

PATENTED FEBRUARY 20th, 1894.

The only Practical, Common Sense Gas Stove Attachment for Cook Stoves and Ranges made.

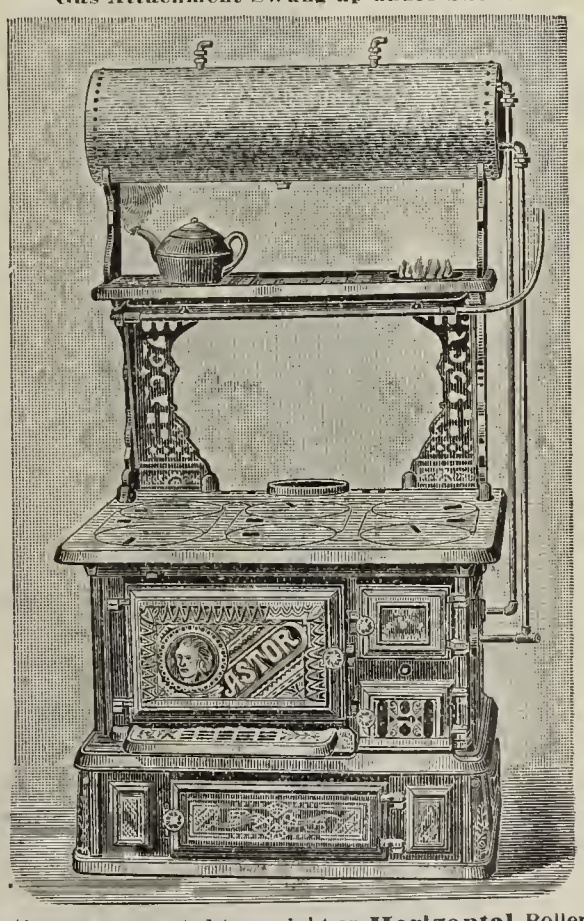
Gas Attachment Lowered to Range.



Adjustable to Our

No.	70	Astor.
"	7	"
"	2	"
"	3	"
"	3	West End.
"	8	Bon Bon.
"	3	"
"	8	Home Run.
"	3	" "
"	8	New Rival.
"	3	" "
"	8	Lakewood.
"	8	New Paragon.
"	9	" "
"	3	" "
"	4	" "
"	8	Durham.
"	3	"
"	8	Massena.
"	3	"
"	8	Paragon B.
"	3	" "

Gas Attachment Swung up under Shelf.



Is adjustable to all our **Portable** Astor and West End Water Back Ranges, whether they are connected to upright or **Horizontal** Boilers Also adjustable to our No. 3 Astor and West End **Brick-Set** Ranges and to nearly all our 8 and 9 inch Portable Kitchen Ranges, as above stated

Exclusive Advantages.—The mantel shelf is not sacrificed when **our** Gas Stove Attachment is lowered to the range. **In Summer,** when lowered to position on top of the range. this Gas Stove Attachment may be used for all household purposes of cooking, etc., and a coal fire dispensed with entirely. **In Winter,** when folded up under the mantel shelf, it can be used as an assistant to the range, the shelf being provided with two boiler holes and kettle rests.

THE UNION STOVE WORKS, 70 Beekman and 66 & 68 Gold Sts., New York. U. S. A.

VAN RANGES,

For Hotels, Restaurants, Public and Private Institutions and Family Use, are unsurpassed. They are made from the finest material, in greater variety and design than any others, at prices proportionate with the best of workmanship.

Our Catalogue is Free to Dealers.

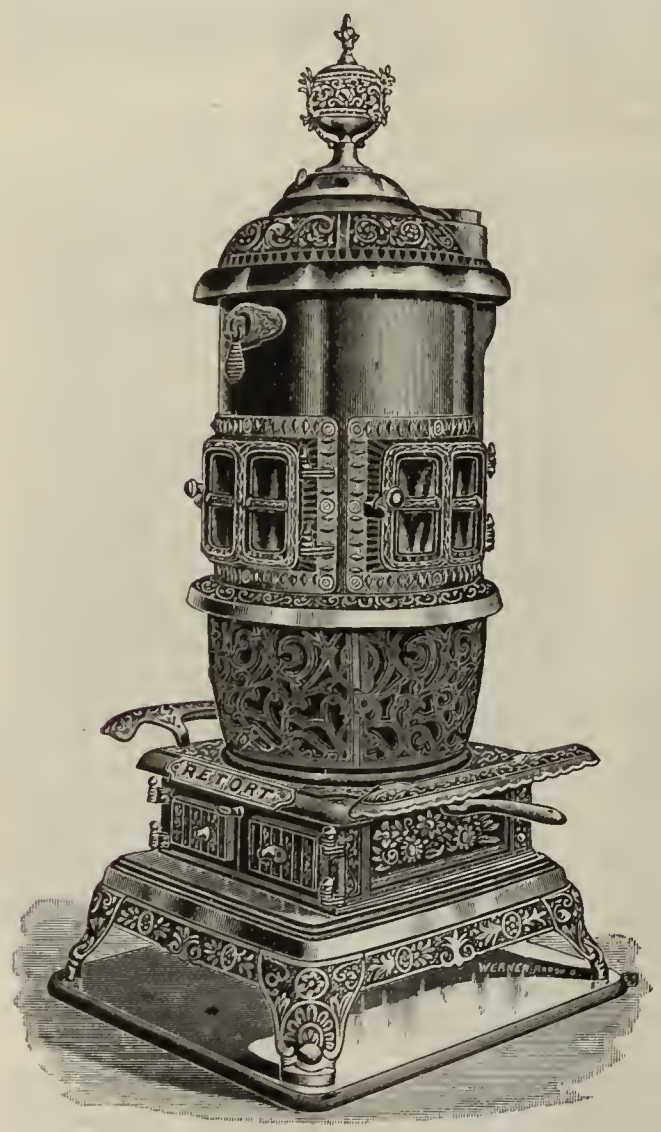


Address

The John Van Range Co.,

CINCINNATI, OHIO.

Mfrs. of Wrought Steel Ranges and all Kinds of Culinary Implements.



"THE RETORT."

Two sizes—Nos. 16 and 18.

THE RETORT

IS THE ONLY

SELF-FEEDING STOVE

That will feed any kind of

SOFT COAL,

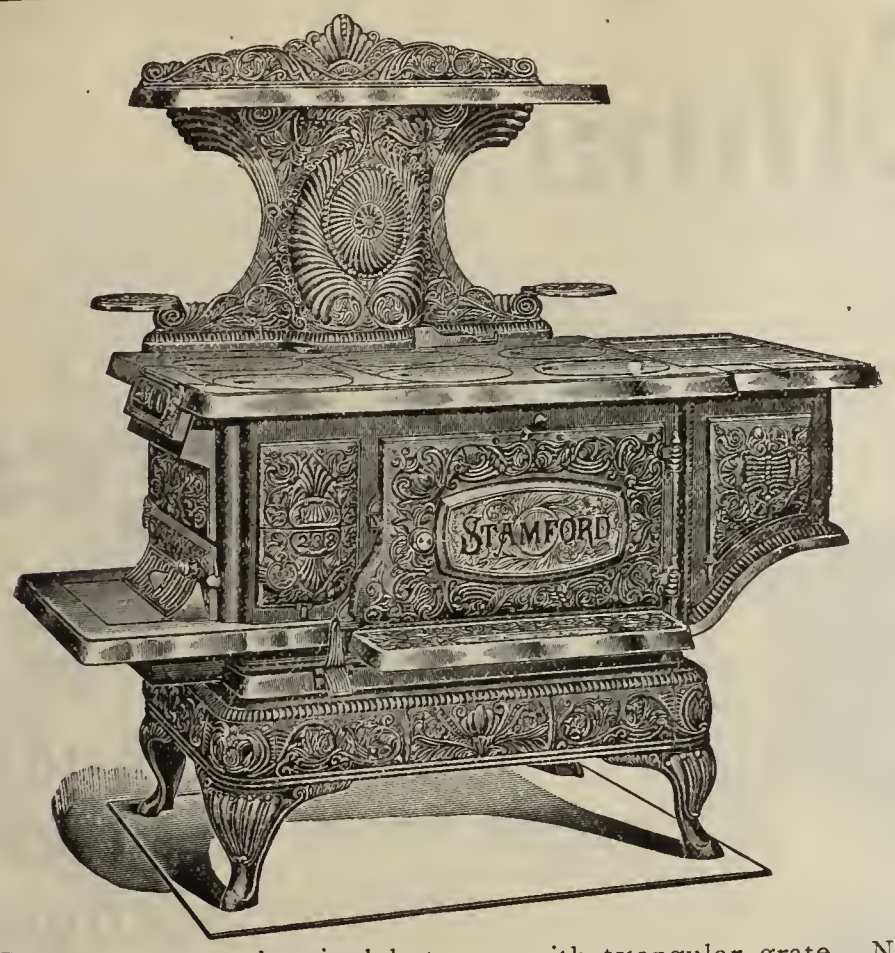
NO MATTER HOW STICKY.

If this be true you know the value of the *exclusive control* of a stove of this kind.

WRITE FOR SAMPLES AND PRICES.

——MANUFACTURED ONLY BY THE——

Marion Stove Co., Marion, Ind.



This range was advertised last year with triangular grate. Now it has triangular, duplex, or flat. All that is needed to change from one style to either of the others is a new number-plate. No changing of bricks or grate frame, nor even taking them out.

Let us send you a full description.

THE STAMFORD FOUNDRY COMPANY,
STAMFORD, CONN.

BEAUTY OIL STOVES.

Twelve Styles and Sizes.

The only Flat Wick Central Draft Oil Stove made. Send for descriptive catalogue to

F. M. BORDEN & BRO., Philadelphia, Pa.
H. RENDTORFF & CO., Chicago, Ill.
C. T. CORBY, 117 Beekman St., New York.

OR TO THE MANUFACTURERS,

TROY OIL STOVE CO., TROY, N. Y.



CORY'S

Excelsior Gas-Tight Furnaces

For Anthracite or Bituminous Coal.

17 Sizes, Portable and Masonry.

From $35 to $125.

All cast iron Furnace. Each section cast in a *single piece*, without bolts, putty or sheet-iron connections. Solid, heavy and gas-tight. Many of the better furnaces made during the past ten years copy this design in part, but fail to add enough radiating surface over the fire-pot to obtain the best results. Send for circular. Manufacturers,

UZAL CORY & CO.,
Established 1847.
210 WATER ST., NEW YORK.

THE HELPER STEEL RANGES
BEST ON EARTH
100 STYLES & SIZES
PATENT OVENS
BUY USE

THEY SELL EASILY BECAUSE

They have points about which
YOU CAN TALK,
Points that never fail to
THE GOOD POINTS
PLEASE BUYERS.

Of these Ranges are so good that the buyer at once admits their excellence.

Drop us a postal card and we'll tell you what THESE GOOD POINTS ARE.

CHICAGO & ERIE STOVE CO.,
CHICAGO, ILL. ERIE, PA.



Luther & Lederhos,

MANUFACTURERS OF



Gas and Oil Stoves,

30 Cliff St., N. Y.

Write for Catalogue and Prices.





Established 1827.

W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons, Andirons, Tiles, &c.

Office and Showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

Gem=Climax

FOR COAL OR WOOD



Ranges

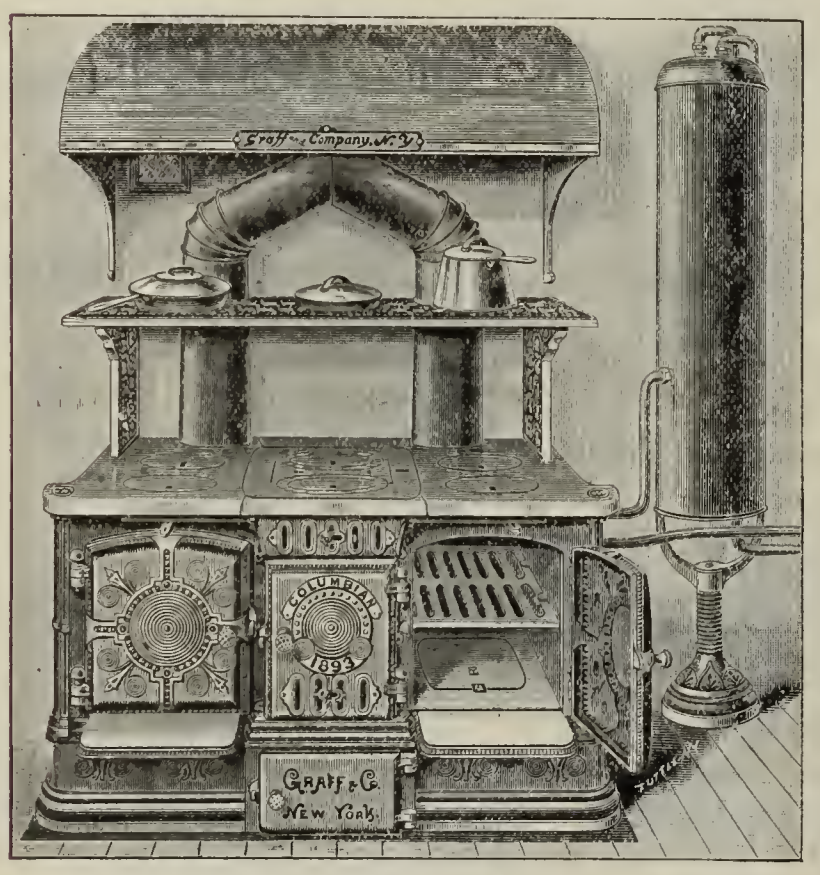
made in all the various styles and sizes. The Flattering Success of the Gem-Climax medium priced, four-hole range is in keeping with all the

SEND FOR CATALOG.

Climax Stoves and Ranges.

TAPLIN, RICE & CO., AKRON, OHIO.

"COLUMBIAN."



DOUBLE OVEN RANGE.

TO THE

TRADE.

THE

"COLUMBIAN"

Is a recent accession to our assortment of first-class

RANGES.

It has some new and important features which cannot fail to interest and please the purchaser.

GRAFF & COMPANY,

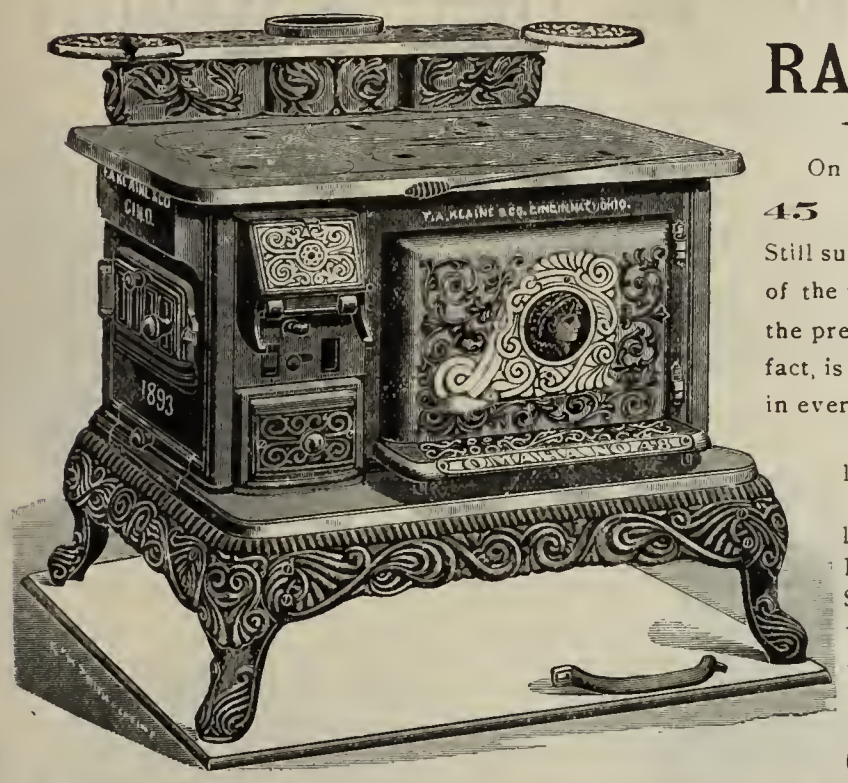
208 Water St., New York.

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FOR THEIR

NEW ILLUSTRATIVE AND DESCRIPTIVE CATALOGUE, * *TO BE ISSUED MAY 1st.* * FERROSTEEL RANGES.

BUY OMAHA



RANGES

On the market

45 YEARS.

Still superior to many of the productions of the present time. In fact, is a modern stove in every respect.

Write for catalogue.

We make a full line of Stove Repairs for all Stoves.

F. A. Klaine & Co.,

CINCINNATI, O.



WE'RE GOIN' HOME.

IT'S TOO HOT FOR US.

THE FRONT RANK STEEL FURNACE,

Like all other good things, is copied and counterfeited. Be sure you get a "Front Rank." We sell furnaces *ONLY.* Consequently it is not a side line. For prices, &c., address

FRONT RANK STEEL FURNACE CO.,

713 North Main St., - - St. Louis, Mo.



The Boomer is a Success.

Guess which is one of the Leading Furnaces offered for sale to-day.

Write for Catalogue, which explains all about the Boomer.

HESS, SNYDER & CO., MANUFACTURERS. **Massillon, Ohio.**



An Electric City.

The following account, given by the Detroit *Free Press* of Great Falls, Mont., appears to fairly entitle that place to the title of the Electric City: At Black Eagle Falls, 3 miles above the town, an immense dam has been thrown across the Missouri. Not only are the street cars propelled and lighted by electricity from the power houses, but they are heated as well by electric radiators, placed in each car. Elevators, printing presses, cranes and all kinds of machinery are operated by the force. There are automatic excavators, electric pumps and electric rock crushers. A not uncommon sight on the street is a mortar mixer attached to an electric wire leading down from a pole. The restaurants cook by electricity, the butcher employs it to chop his sausages, the grocer to grind his coffee and the tailor to heat his goose. The subtle fluid is a welcome blessing in every home; the housewives run their sewing machines and heat their flatirons by electricity. They have electric broilers and tea kettles, and they bake their cakes in electric wooden ovens that can be set away on a shelf like pasteboard boxes.

— A Farmer's Philosophy. — There is being so much said in this country about hard times and the scarcity of money, and as everybody has a cause and knows a remedy, I thought I would write to tell your readers what I think is the cause.

"We buy more than we produce.

"There is too much flour and bacon shipped here every year. The things we ought to make at home we are buying

"We let our timber rot and buy our plow stocks, singletrees, axe handles, hoe handles and fencing.

"We throw away our ashes and buy soap and axle grease.

"We give away our beef hides and buy hamestrings and shoestrings.

"We waste our manure and buy guano.

"We buy garden seed in the spring and cabbage in the winter.

"We let our land grow up in weeds and buy our brooms.

"We waste the wax out of our pine and gum trees and buy chewing gum for our children.

"We build schoolhouses and hire teachers and send our children off to be educated.

"We land a five cent fish with a four-dollar fishing rod.

"We send a fifteen-cent boy out with a twenty dollar gun and a four-dollar dog to kill birds.

"We raise dogs and buy wool.

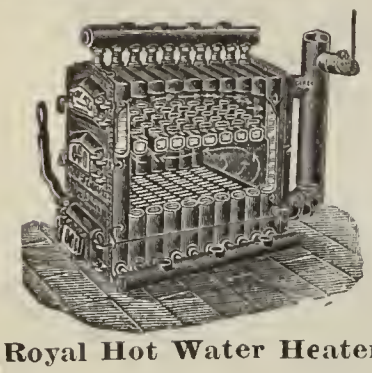
"And about the only things in this country that there is overproduction of are politics and dogtics."—*The Press.*

— Father McNally (with righteous indignation): "Fer shame an ye, O'Bleary. Ye're half dhrunk."

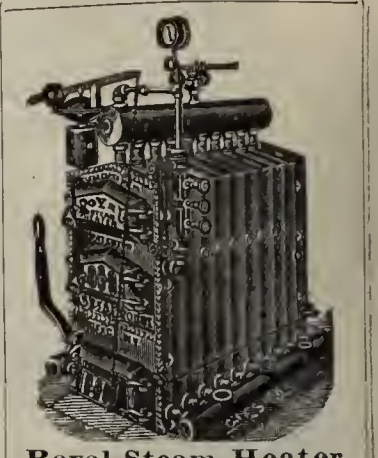
O'Bleary (apologetically): "Oi know it, yer worship; but it's not my fault. Oi've shpint all the money Oi had."—*Puck.*

Sold on their Merits,

and not on their Antiquity.



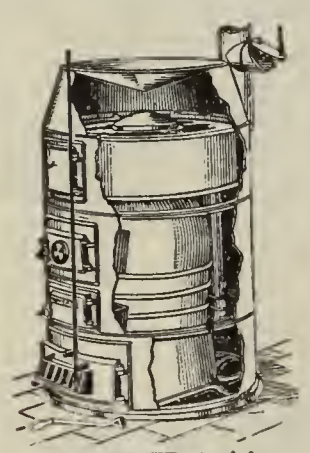
Royal Hot Water Heater.



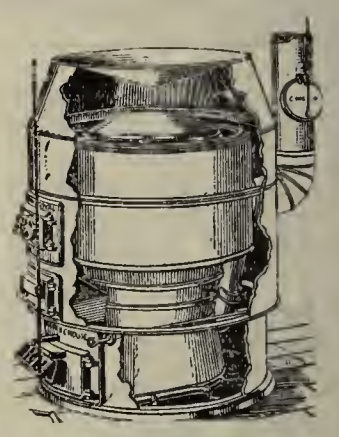
Royal Steam Heater.



Imperial Hot Air Furnace.

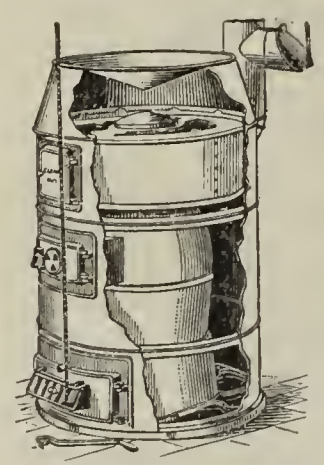


Royal Hot Air Furnace.



Prince Royal Hot Air Furnace.

ROYAL HEATERS



Royal Victor Hot Air Furnace.



Prince Royal Combination Heater.

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CHICAGO, 113 LAKE STREET.

W. M. MACKAY, Manager Hot Water and Steam Dept., No. 211 Water St., New York.

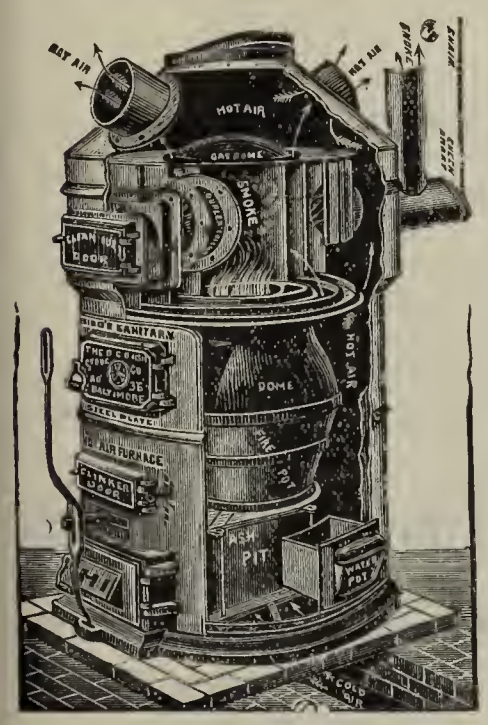


KEEP IN MIND

The Plummer Steam Heater
AND
The Leader Hot Water Heater.

11TH SEASON.

Putnam Foundry and Machine Corporation,
PUTNAM, CONN.



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Manufacturers of

THE BIBB SANITARY HOT AIR FURNACE.

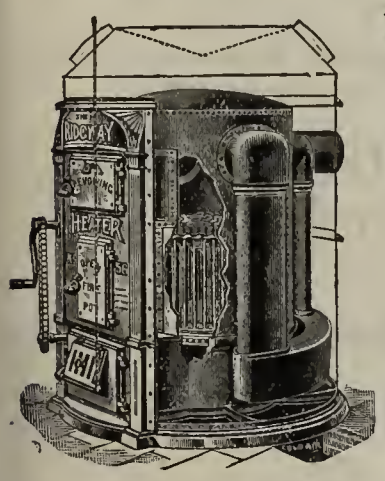
Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

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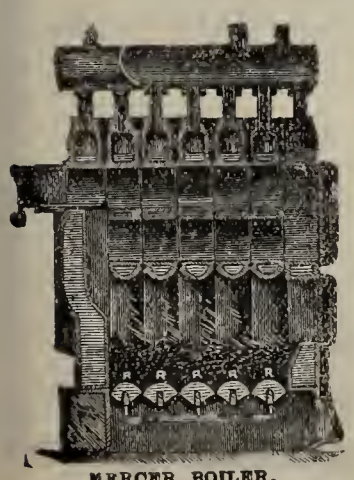


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FOUNDRY, WESTFIELD, MASS.



United States Weather Bureau.

Prof. Herrington, Chief of the Weather Bureau, in a report made to Secretary Morton on the efficiency of the bureau service, furnished the following illustration of the rapidity with which meteorological information is gathered and distributed. The observations, as is well known, take place simultaneously all over the United States at 8 a. m. and 8 p. m. Washington time. On Friday morning, April 6, the morning reports were all in at 9.05. The time required to gather all the reports throughout a territory extending from Father Point and Sydney in the Northeast and Jupiter and Key West in the Southeast to Corpus Christi and Los Angeles in the South and Southwest and the Spences Bridge and Edmonton in the Northwest was 54 minutes, the fastest time on record by four minutes, not a single report being missing. At 10.42 a. m. the map, for which two colors are necessary, was on the press, and 36 minutes thereafter was in the post office, so that within 3 hours and 18 minutes from the time when the observers throughout this vast territory began to read their barometers the synoptic map was in the mail.

Antiquity of Horseshoes.

The earliest form of the horseshoe was a leather boot, says Dr. S. J. Harger, of the University of Pennsylvania Veterinary School. But this boot was only worn by heavy war horses. The ordinary horses of the Greeks, Romans, Arabians and other natives were unshod, though methods of hardening the hoof were occasionally used. The earliest written record of metal shoes is found in a book by the Emperor Leo VI., who died 911 A. D., but horseshoes have been found in tombs that date back to the sixth century. The earliest Oriental form of shoe was nearly circular and was fastened on, not by nails, but by flanges driven into the side of the hoof. The Arabian farriers even to-day shoe their horses cold and regard the European method as injurious.

A Big Cargo.

The twin screw cargo steamship "Cevic" of the White Star line, biggest freighter afloat, sailed on her maiden voyage to Liverpool with the largest cargo ever stowed in a single vessel since Noah's time, says the New York *Sun*. Exclusive of 820 Western steers, the cargo consisted of 14.000 tons of merchandise, including 150,392 bushels of corn, 9030 bales of cotton, 3200 quarters of beef, 1955 pigs of copper, 2328 pigs of lead, 3491 bags of flour, 56 logs of mahogany, 511 bales of hay, 3338 boxes of cheese, 1955 barrels of oil, 1999 barrels of green hides, 639 barrels of wax, 408 boxes of bacon. The value of the entire cargo is computed to be somewhat less than $500,000. It is likely that the "Cevic" will make the trip to Liverpool in nine days. She is 520 feet long, 60 feet wide and 38 feet deep.

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—BY—

STEAM, HOT WATER AND HOT AIR

With Introduction and Tabular Comparisons.

Second edition, revised. To which has been added a selection from the Letters of Criticism on the Essays as originally published in THE METAL WORKER and a chapter on Proportioning Radiating Surfaces.

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"It constitutes one of the most valuable works on the subject of house heating hitherto published. It is a terse compendium of practical knowledge of all that is most useful on the subject, wholly ignoring an enormous amount of useless speculation upon the subject comprised in numerous volumes and the current literature of the day—written by persons who adopt theories and vainly search for facts to sustain them—not worth the reading. *Per contra*, the work before us is alike commendable to major-domos who would be well informed on the subject, and to engineers of heating and ventilation, who cannot afford to do without it."—*The Sanatarian.*

"There are fifteen essays in all, and every one of them is well worth the careful consideration of those interested in this most important subject. . . . The work is undoubtedly one of the most practical and highly valuable ever given to the public on the subject of house heating, and so thoroughly contrasts the different systems considered as to leave the subject almost, if not completely, exhausted. We commend it to the kindly consideration of all of our readers who desire the most practical views on the subject of which it treats."—*The Age of Steel.*

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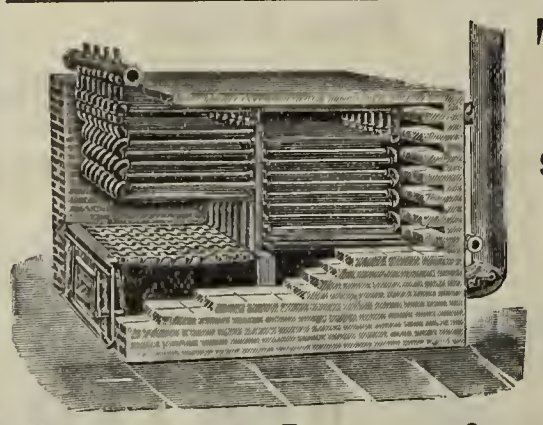
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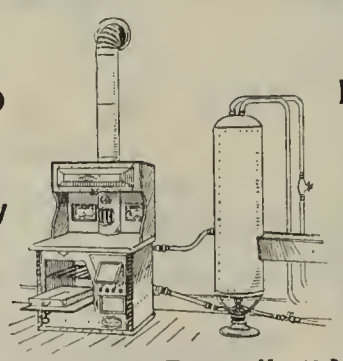
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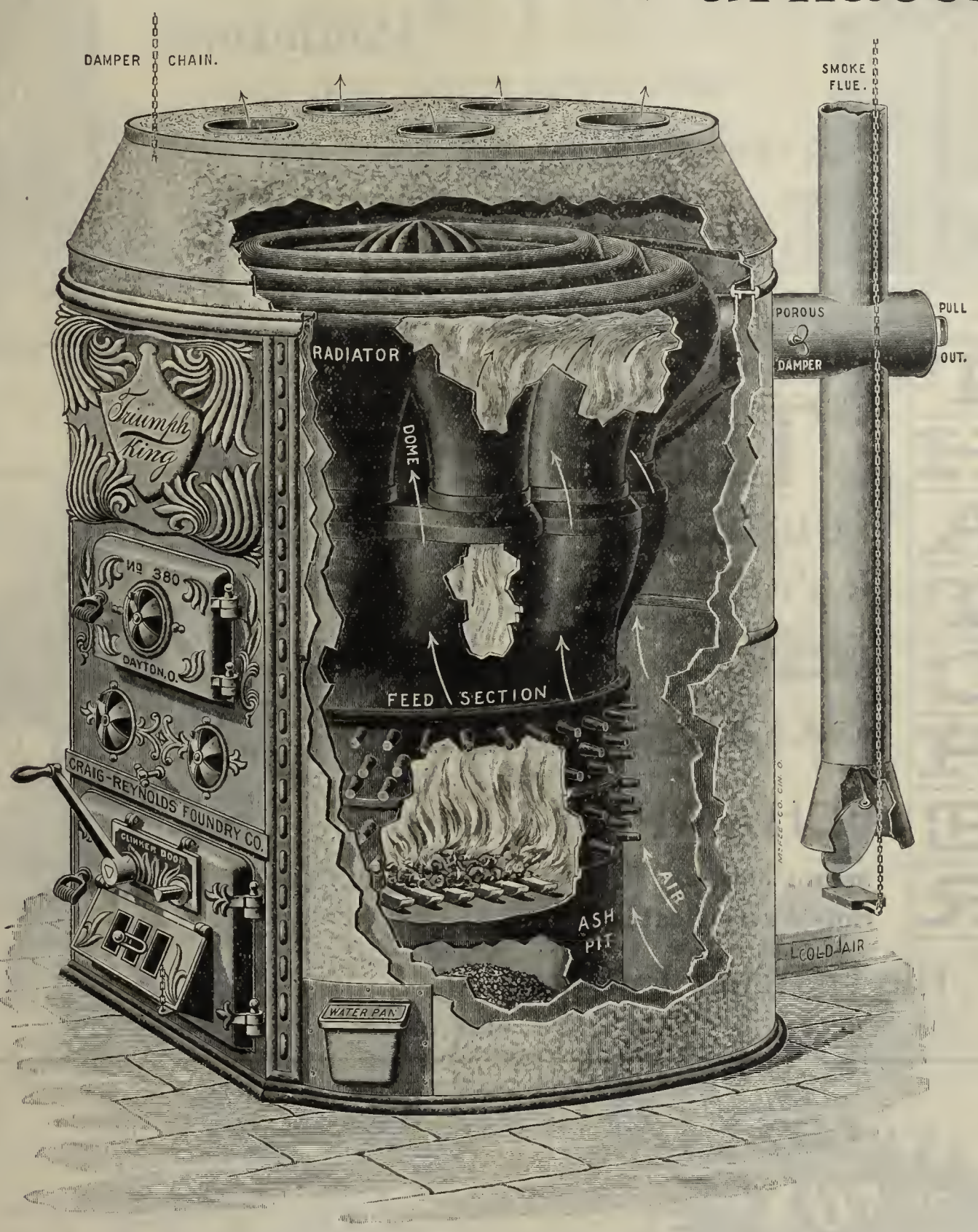
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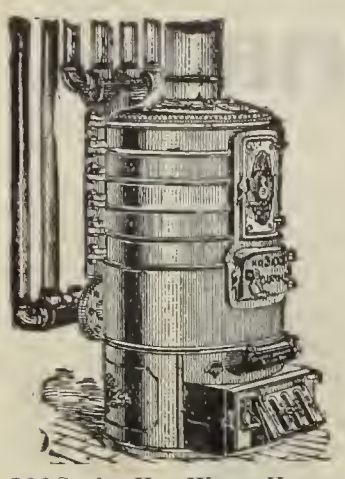
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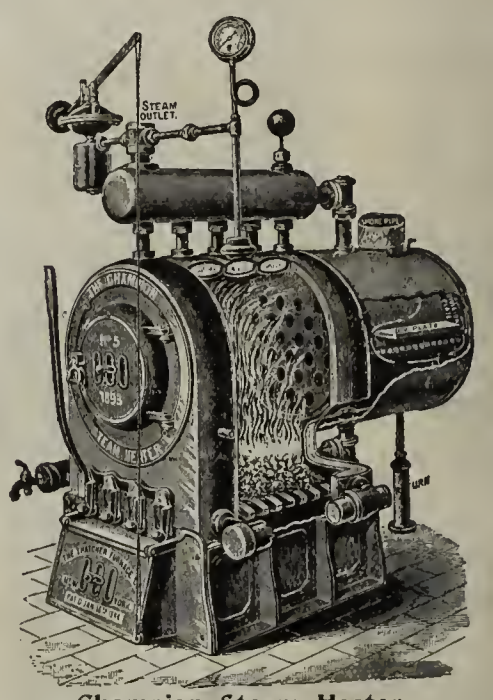
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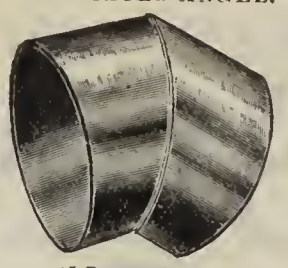
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FOUR PIECED ELBOW.

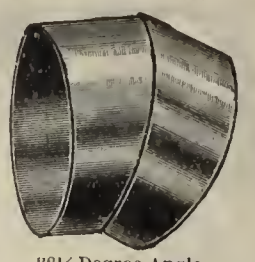


TWO PIECED ANGLE.



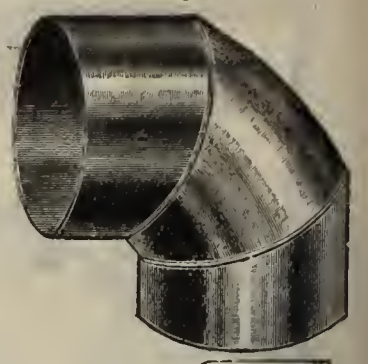
45 Degree Angle.

TWO PIECED ANGLE.

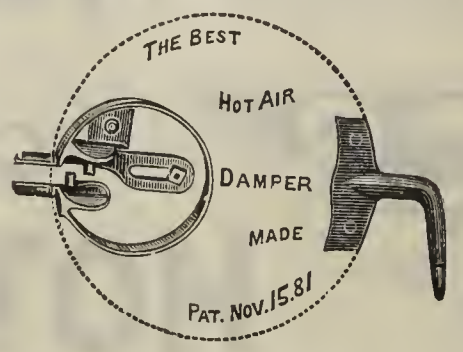


22½ Degree Angle.

THREE PIECED ELBOW.



DAMPERS COMPLETE FOR HOT AIR PIPE.



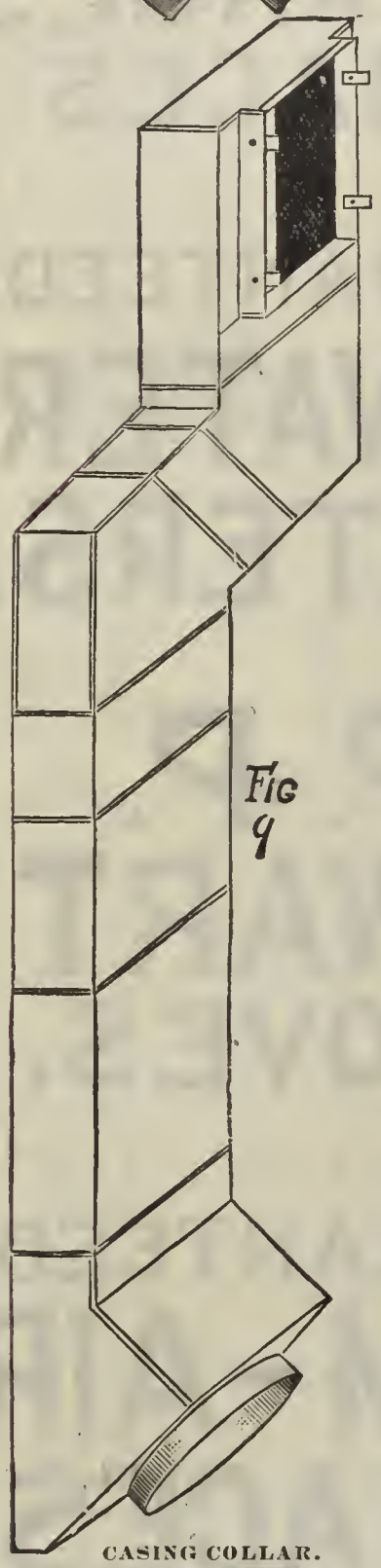
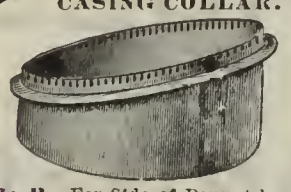
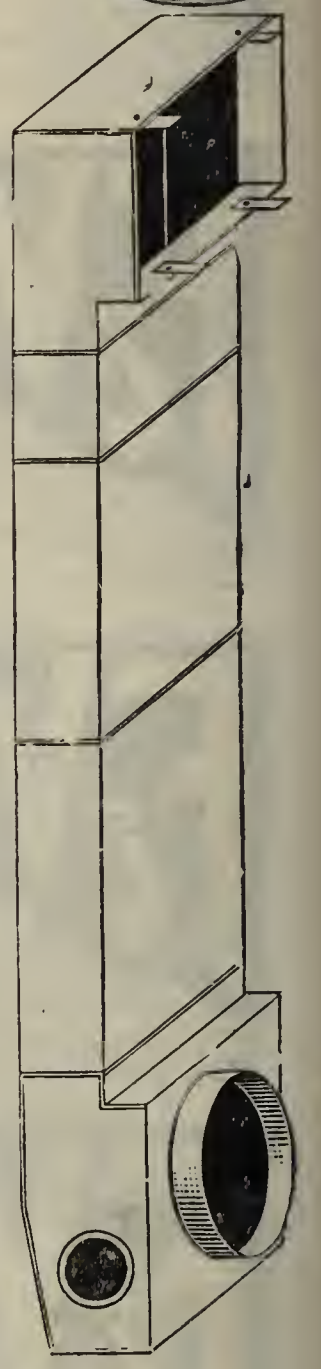


Fig 9

CASING COLLAR.



Style B. For Side of Bonnet having 75 or 60° pitch.



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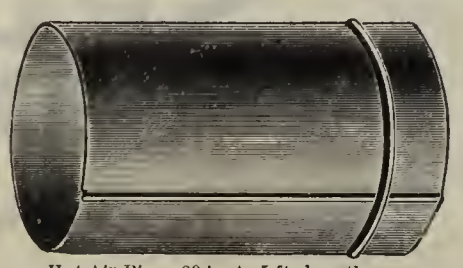
CASING COLLAR.



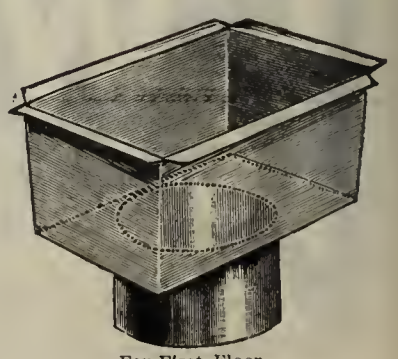
Style A.
For Top of Bonnet.



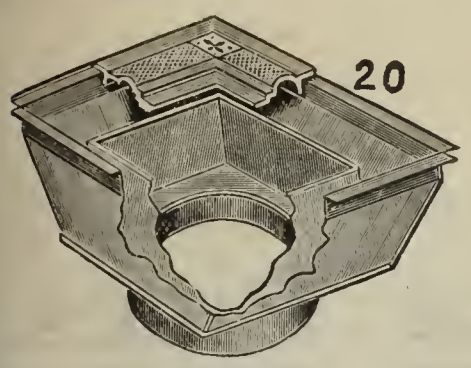
Cut No. 24—For First Floor.

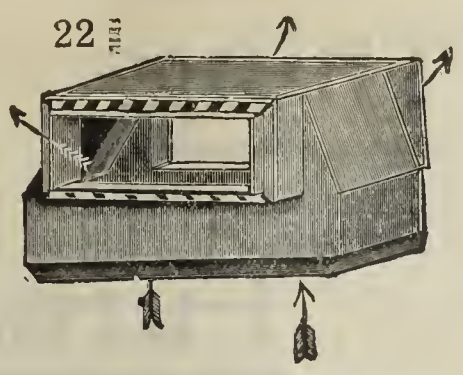


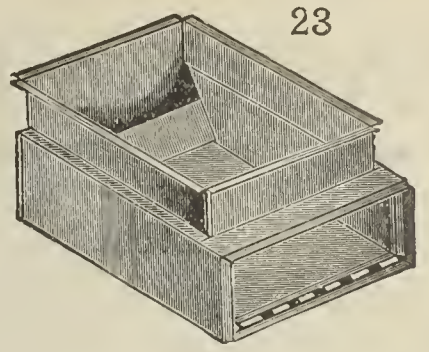
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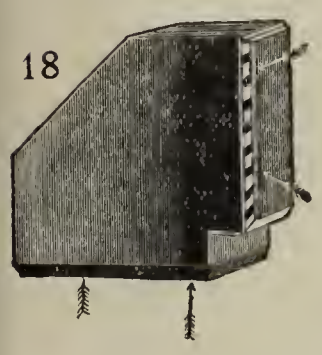


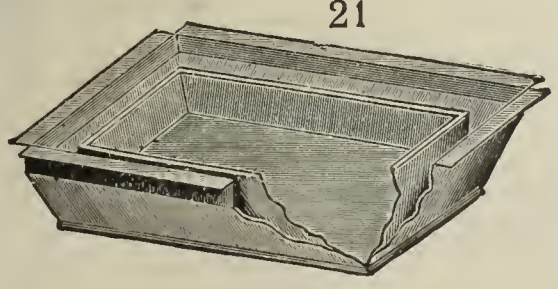
For First Floor

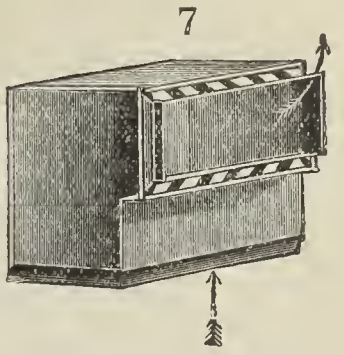

20


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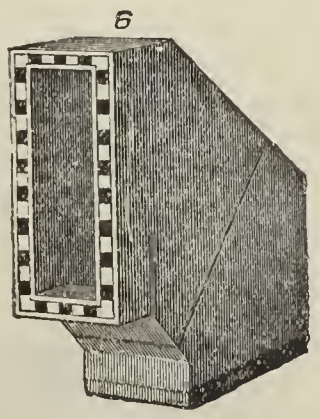

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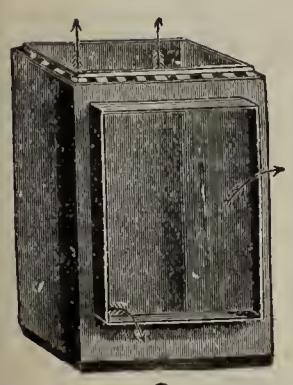

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We Have About
What You Want?


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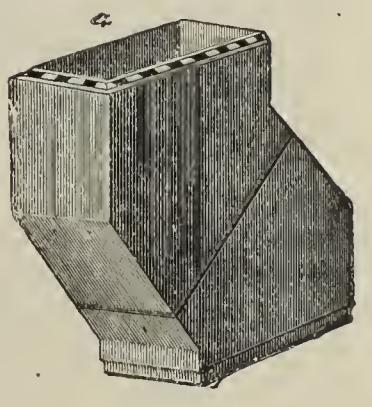

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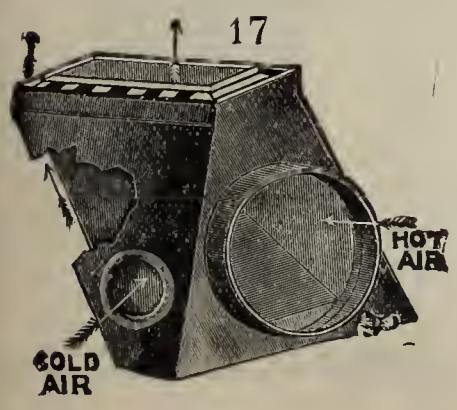
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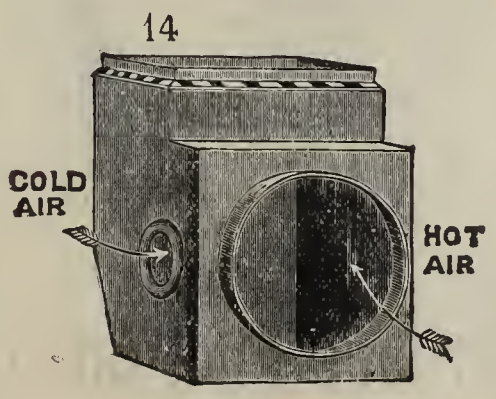
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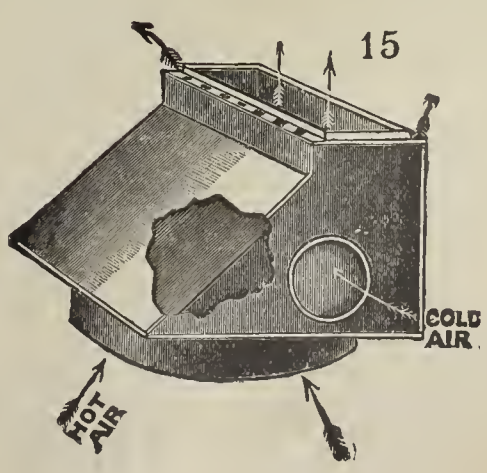
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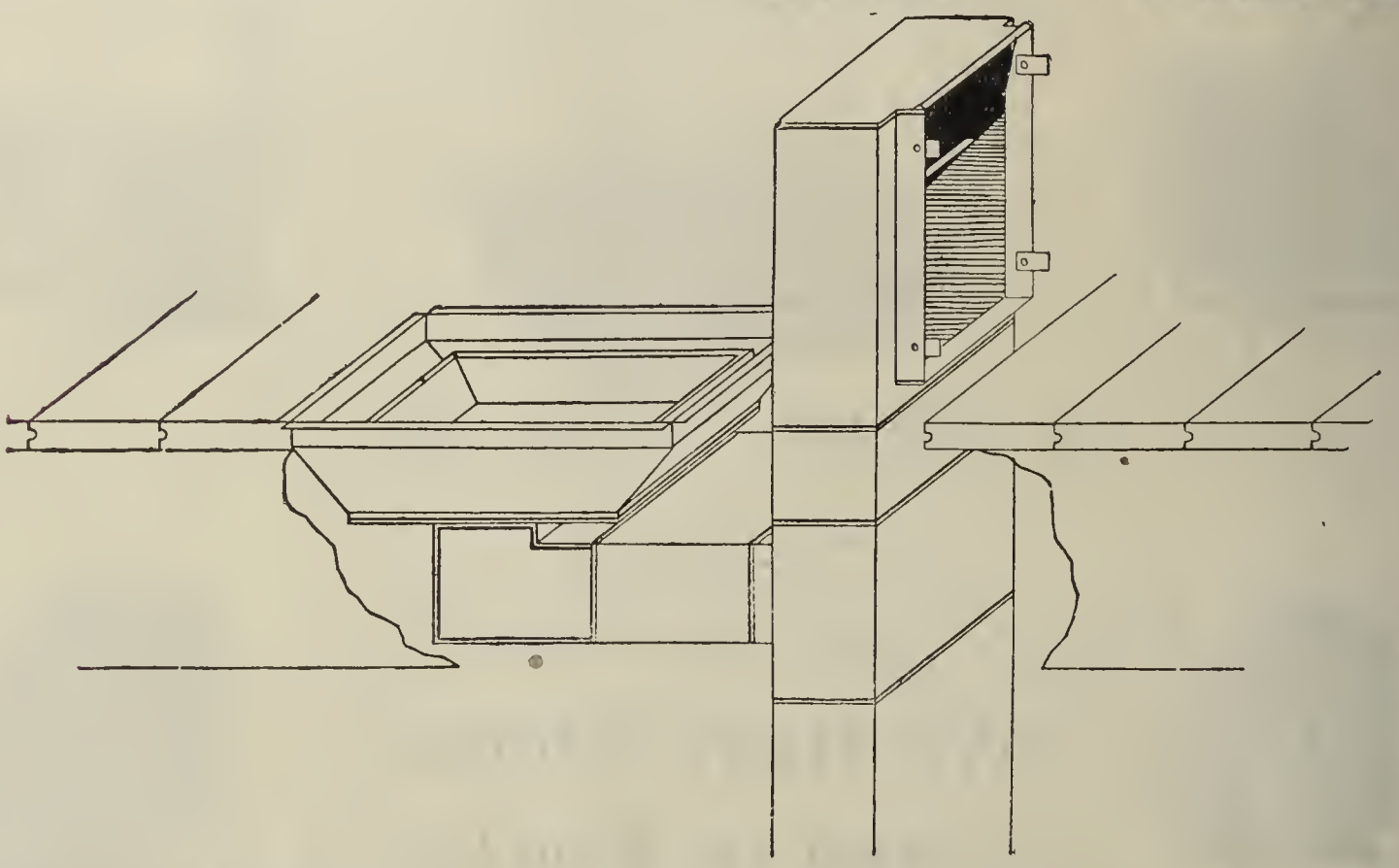

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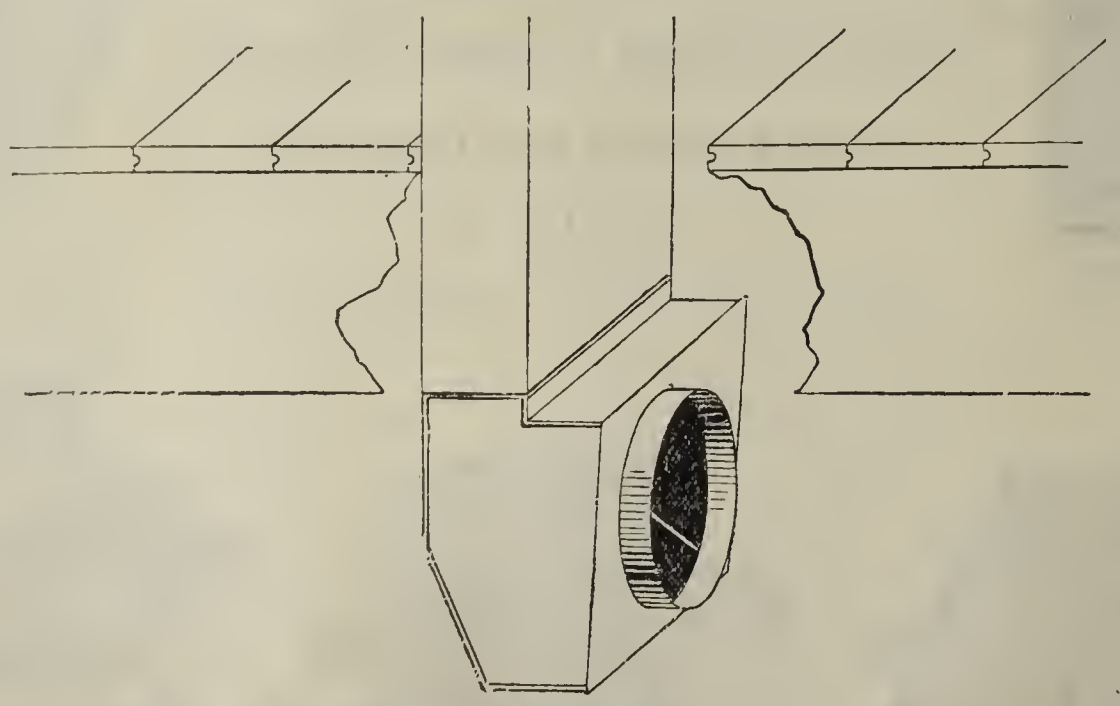
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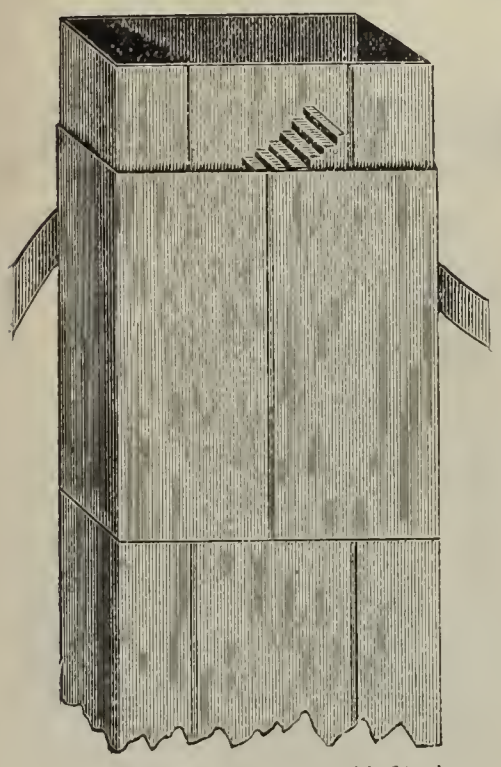
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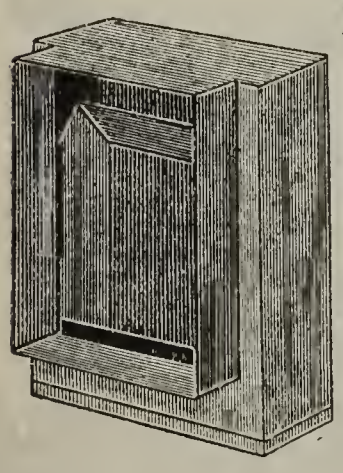
LENGTHS.	SIZES DOUBLE STACKS.								SIZES SINGLE STACKS.					
	4 x 8	4 x 0	4 x 11	4 x 12	4 x 14	6 x 10	6 x 12	6 x 14	3¼ x 7	3¼ x 9	3¼ x 10	3¼ x 11	3¼ x 13	
10 ft. 6 in. long.	2.30	2.40	2.60	2.75	3.05	3.30	3.60	3.90	1.15	1.20	1.30	1.38	1.53	IX Goods 20 % Advance.
11 ft. 3 in. long.	2.36	2.48	2.65	2.83	3.15	3.38	3.71	4.05	1.18	1.24	1.33	1.42	1.56	
12 ft. 0 in. long.	2.60	2.75	2.95	3.15	3.55	3.95	4.10	4.50	1.30	1.38	1.48	1.58	1.78	
12 ft. 9 in. long.	2.85	3.00	3.25	3.45	3 90	4.15	4.55	5.00	1.43	1.50	1.63	1.73	1.95	
13 ft. 6 in. long.	3.10	3.25	3 50	3.75	4.25	4.55	4.90	5.50	1.55	1.62	1.75	1.88	2.13	

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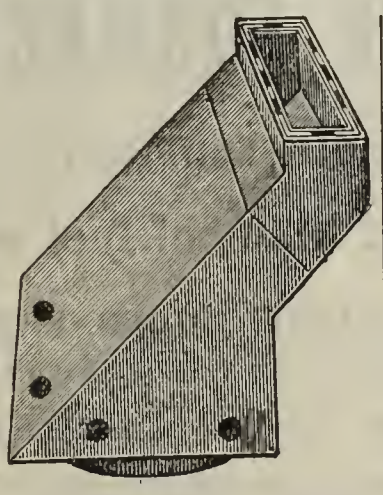
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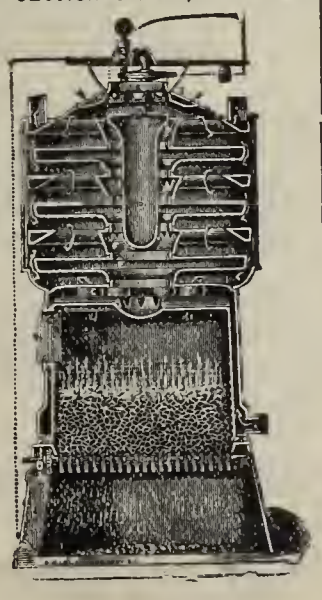
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"What did he do?"

"Stood his ground while another officer shot at a dog."—*Chicago Inter-Ocean.*

— The New Minister.—Mrs. Gushly: "Dear me, the new minister is such an interesting young man."

Mrs. Winks: "What did he talk about when he called?"

Mrs. Gushly: "I told him all about the baby's new tooth."—*Inter-Ocean.*

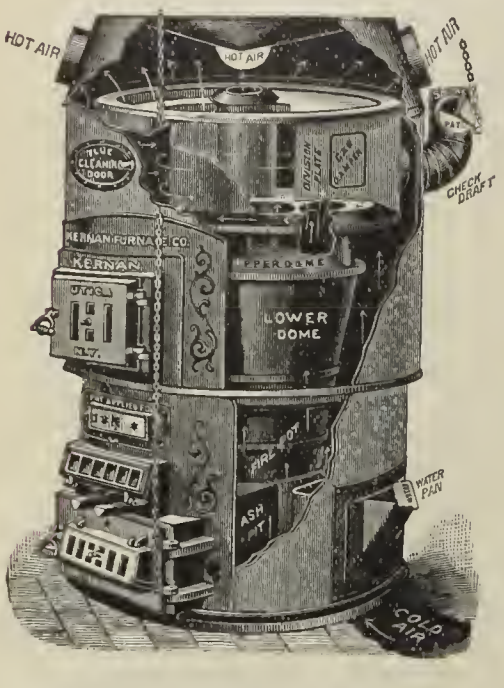
— Abject Adulation. — Princeling (opening the shooting match): "Donnerwetter, I have gone too far to the left!"

Gamekeeper: "Oh, not at all, your Highness; the target is fixed too much to the right."—*Frietagzzeitung.*

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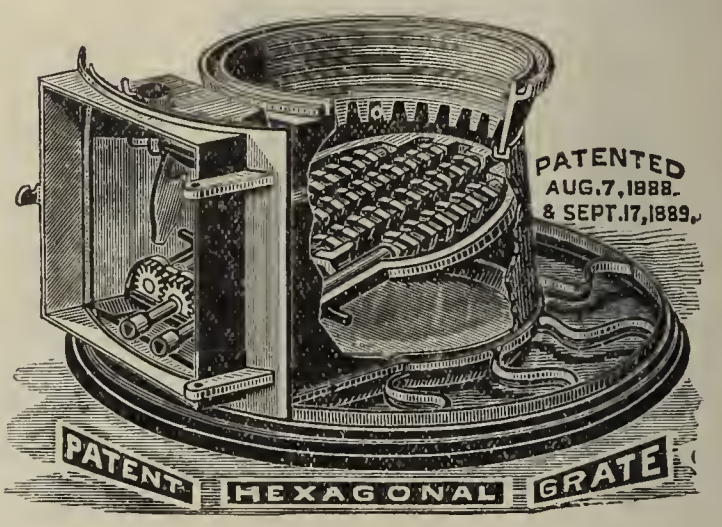
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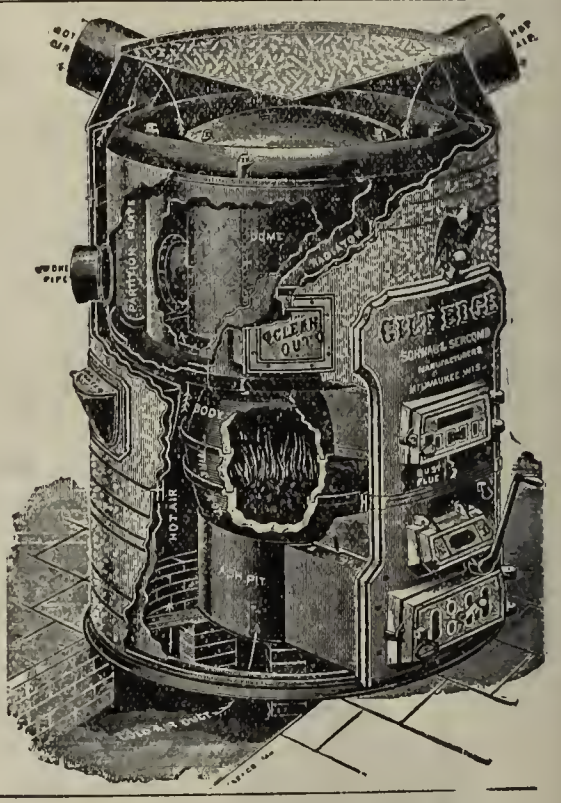
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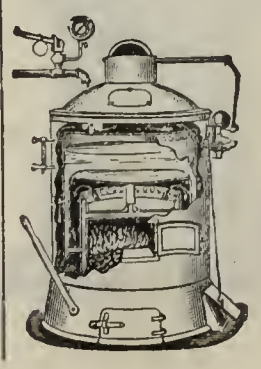
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The Simplest, Cheapest and Best.

This Heater has been long and favorably known as the "Schimpf" boiler, but the entire property and plant having been recently purchased by a syndicate of influential men, it has been deemed best to change the name to "Peerless," and the Heaters will be known hereafter by that name.

A TESTIMONIAL.

JOHN WANAMAKER,
Mechanical Department, Philadelphia, Pa.

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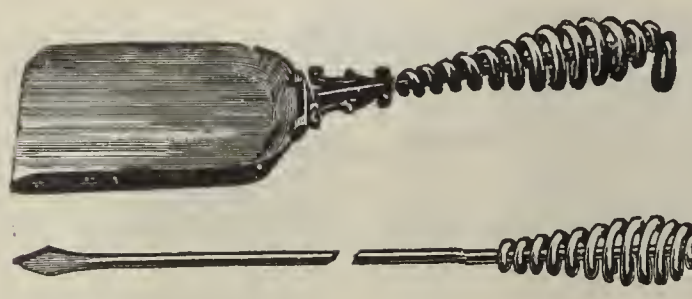
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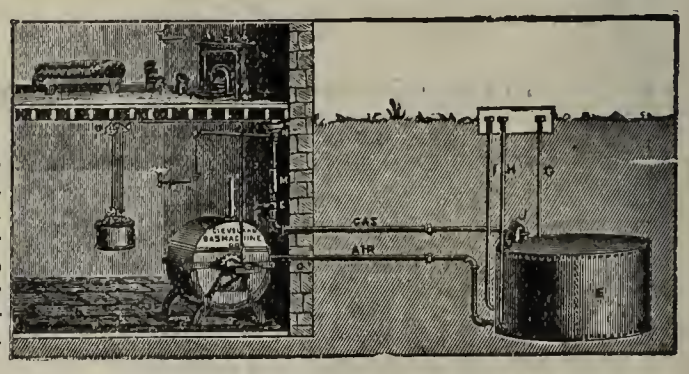


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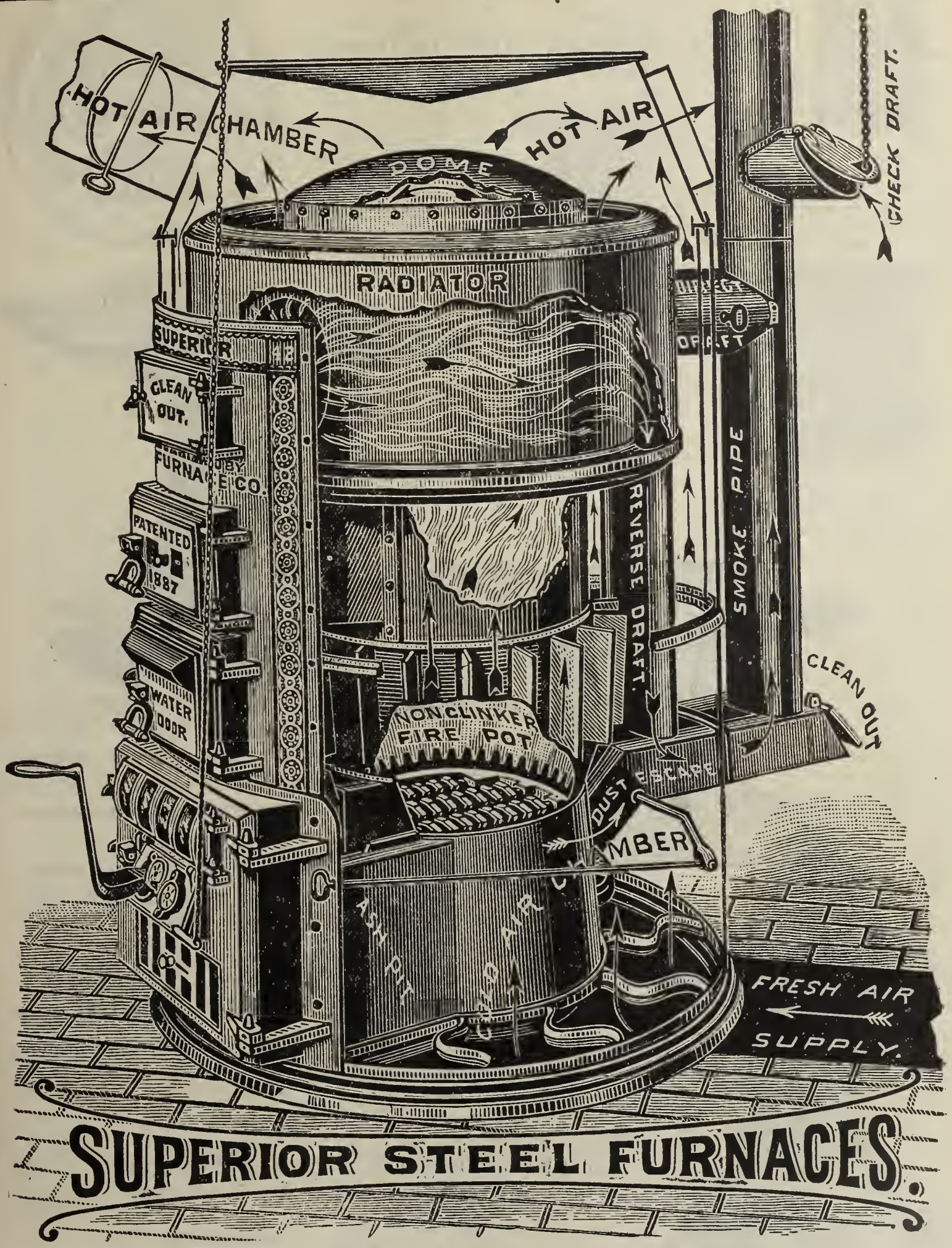
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List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8½ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

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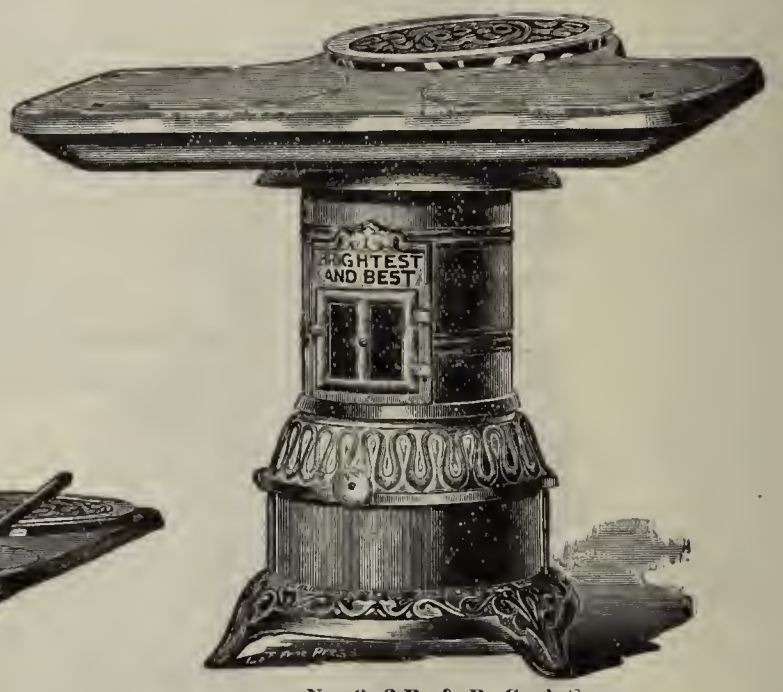
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Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.



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B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, April 28, 1894.

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Heating from Central Stations.

The heating of buildings distributed over wide districts from large central stations has been on trial in New York and other big cities for a sufficient time to give an answer with reference to the profitable or unprofitable character of the business. The financial results are generally believed not to have been satisfactory to investors in a number of these enterprises; yet, within certain reasonable limits, there is nothing apparent that would render a system of heating from a central station incapable of yielding a fair profit. The chief mistake appears to have been in the attempt to include too much in a single installment. It is not to be denied that however well steam pipes may be protected by insulating covering, any increase of their length from the steam generator to the place at which they deliver their steam increases the expense of supplying steam to that place. It is possible to conceive a steam pipe so long that all the steam which could enter it and flow through it under high pressure from a steam boiler would be condensed to water before reaching the extremity of the pipe. It is not probable that in any of the large plants referred to this limit has been reached; but there can be no doubt in some instances pipes have been laid underground to such distances as to condense a large percentage of the steam they conveyed before it reached its point of useful application.

Smaller Installments Suggested.

The question arises as to what great advantage can be gained by attempting so much from a single central station, even were it possible to reduce the loss through condensation to an amount comparable with the loss experienced with good practice in ordinary steam heating plants. A central station requires a certain amount of land to accommodate boilers and provide for a storage of coal. Suppose it to occupy one or two city lots. The amount of boiler power that could be accommodated thereon, with allowance for needful storage, would not be more than sufficient to supply to a few large blocks of city buildings the steam required for heating, elevators and other purposes. Now if it be required to supply a similar quantity of steam to buildings further away, is it not a common sense view that it is better to establish another central station at a distance from the first, rather than buy adjacent lots and build on one plat a plant large enough for both districts, thus increasing the cost of pipes for distribution, subjecting the enterprise to largely increased losses of heat, and also increasing the engineering difficulties in the construction and maintenance of the plant in working order? Many engineers asserted that this was the common sense view years ago, when the great heating schemes were first projected; and experience has proved the wisdom of this view.

Gas for Cooking.

The practicability of gas for cooking is demonstrated by its use to the exclusion of any other fuel in many apartment houses. In some of the handsomer houses in which a suit of seven or eight rooms rents for from $50 to $100 a month no other means for cooking are furnished. Compared with the kitchens of the past, these tiled and decorated culinary apartments, with modern cooking apparatus, are wonderfully attractive. The satisfaction attending the use of gas is illustrated by the experience of a furnisher who supplied 49 ranges in a new house, and though the tenants had never cooked with gas, but two out of them all insisted on having coal ranges; and on the arrival of summer these two were eager to secure gas ranges. The change was not a little influenced by the servants, who learned from those who used gas ranges how convenient and free from heat they were. A manufacturer of gas ranges who was desirous of comparing the cost of fuel for cooking employed the janitor in one of these large houses to make a canvass and learn the amount paid for gas. He found the average to be about $5 per month, including what was used for lighting, with the gas at $1.25 per 1000 feet.

The Armies of Unemployed.

The organization of unemployed men and tramps into so-called armies to march over the country is an entirely new idea. It will hereafter be referred to in history as originating after the panic of 1893. The movement seemed insignificant at first, and Coxey's march to Washington was regarded as a joke to enliven the columns of the newspapers for a few days and was then expected to pass into utter oblivion. But the events of the last few days have put a much more serious aspect on the situation, and there is promise of enough happening to make future historians inquire closely into the causes, progress and results of this curious manifestation of unrest. At the present time there are some eight or nine "armies" struggling to reach Washington from various parts of the country. In a numerical sense these "armies" form no special menace to the order and peace of the country. There are too few of them and they are too widely scattered to do much damage. They may cause annoyance to the towns through which they pass, but such towns are but a small part of the country as a whole. As long as the "commonwealers" or "industrials," or whatever they may be termed, are so few in number they can do no particular damage even if some of their leaders indulge in very foolish talk. Experience has shown, however, that when there are many workmen idle some join the professional loafers and hoodlums in starting riots in large cities which cause much destruction to property. The incentive is frequently quite light. The railroad riots of 1877 would not have been so serious and disastrous if the trouble had been confined to those immediately interested. But idle workingmen and the riffraff of cities, always eager for turbulence, took up the cause of the disgruntled railroaders, made common cause with them and carried the conflict far beyond the anticipation of the leaders of the original strikes.

It is asserted upon good authority that at present prices there is no profit attached to galvanizing steel sheets. Manufacturers are contented, perforce, with a fair profit on the black sheets and go to the trouble of galvanizing in order to find a market for the products of their mills. An effort is being made to get all galvanized iron manufacturers into the Galvanized Iron Manufacturers' Association, for the purpose of maintaining better prices, but there are a few who have not yet signified their intention and independet action continues.

Ex-President Harrison, in concluding his course of law lectures at the Stanford University of California, gave the students some advice which is significant as coming from so competent a source. He counseled them to "stick to their profession, avoid politics and never seek office."

Negotiations are, it is said, pending for uniting the independent cordage interests of the country with the United States Cordage Company.

THE LETTER BOX.

Protection for Copper Cornices.

From J. F. F., *Savannah, Ga.*—Will *The Metal Worker* inform me what is the paste used to put on copper to keep it from tarnishing while it is being worked into a cornice, and what should be used for cleaning after the cornice is made? There are various ways of cleaning copper, but when the hands are placed on it the place touched soon discolors. If the cornice is cleaned after it is made, while putting up it is again covered with finger marks. What I want is something to keep the copper clean while it is being made up.

Note.—We shall be glad to hear if any of our readers have been successful in overcoming this difficulty. The use of lacquer for coating the material and gloves have been suggested, but are not found to be generally used. The common method of cleaning copper work is to scour it with fine pumice or emery made into a paste with oil, so it will not blow away. The powder is removed by polishing with some soft material, and if it has made no scratches and the corrosion has not been too deep, a clean, bright surface is left. This can either be done before or after the work is in position on the building. With this material there is nothing to start discoloration anew, and the surface is left to take the color naturally resulting from exposure.

Lukewarm Water.

From J. R. F., *Southington, Conn.*—Referring to the letter of "C. D. F." in *The Metal Worker* of April 14, would say that I have had the same trouble which he reports and found it to be due to impeded circulation in the pipes. If he will take down the boiler he will find the bottom pipe full of sediment, especially if the boiler has been in use a number of years. It is possible, also, that he will find that the tube which connects with the cold water supply inside of the boiler has rusted off and dropped out of place, so that the cold water mingles with the hot.

Seeking Education.

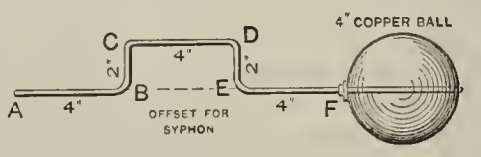
From SUBSCRIBER, *Washington, D. C.*—I notice your article in *The Metal Worker* of April 7 on the subject of self education. Please give names of books you would recommend and the most important studies, or with whom can I correspond for information.

Answer.—We would be glad to assist our correspondent in mentioning books for reading or study, but he has not told us what line he wishes to pursue. Of course he knows that the groundwork of all education is the usual school studies of arithemetic, geography, natural philosopy, history, &c. But we should imagine that he was looking for instruction in some particular trade, and it would be quite useless for us to give him a list of works on electricity, for instance, if he were seeking self education in plumbing. If our correspondent wishes to take a regular course of this sort we would advise him to write to the Correspondence School of Mechanics and Industrial Sciences, Scranton, Pa., who give instruction by mail in a great number of different branches.

Straight and Crooked Levers.

From APPRENTICE, *London, Ont.*—I am a reader of *The Metal Worker* and an apprentice at the plumbing trade, and will be obliged to you for an answer to the following: Does the offset on a ball cock lever add to its power in action? In the accompanying sketch the length of the lever is 16 inches. Would not a lever from A to F 12 inches long be just as powerful?

Answer.—Our correspondent's view of the matter is correct. A ball



Straight and Crooked Levers.

cock arm is simply an ordinary lever with the fulcrum at A and the power applied at F, which is the point at which the buoyancy of the copper ball acts on the lever to force it up. The power of a lever of this sort depends on the distance between the application of the force and the fulcrum, and it practically makes no difference what the shape of the lever is. The offset, therefore, does not increase or diminish its efficiency. We, of course, assume that the lever arm is rigid.

Boiler Rumbles.

From E. W. Y., *Pawling, N. Y.*—I would like to have explained through the columns of *The Metal Worker* what causes and how to remedy the rumbling noise in a range boiler when hot water is drawn out. Should the cold water pipe from the boiler to the range be lower at the range?

Answer.—In *The Metal Worker* of January 27, February 3 and March 17, an explanation is given of the cause of the rumbling noise. It is due to the generation of steam in the water back and its passage to the boiler, where it condenses, and the water rushing in to fill the space that was occupied by the steam makes the noise. A remedy used in a number of cases is a pipe called a relief pipe, running from the top of the boiler to the top of the tank, where it turns over so that the steam generated may pass off as fast as it is made and the noise be avoided. Owing to surrounding conditions it is not always possible to so set a boiler that the pipe running from the boiler to the range will be lower at the range, but where it can be done it is undoubtedly the better plan.

Wants an Insulator.

From E. T., *Wyncote, Pa.*—Can you tell me a good way to pack or wrap pipes to prevent them from freezing, where they must be run up on the outside of a building?

Answer.—The most satisfactory way to protect pipes from freezing is to box them in and fill the space around them with some non-conductor of heat. The large tanks on the top of high buildings in New York City which supply the buildings with water have a pipe that leads from the tank down through the roof, and the length of exposed pipe varies from a few inches to some feet. A very common practice is to box these pipes and fill the space with sawdust. Sometimes mineral wool or asbestos is used, and at other times the pipes are securely wrapped with several thicknesses of hair felt.

Chimney Condensation.

From R. C., *Fillmore, N. Y.*—Will *The Metal Worker* please inform me what makes the black liquid run from a furnace smoke pipe where the pipe is long and runs up through the house, and if there is any way to stop it? We have pipes that give considerable drip from condensed smoke, especially when wood is burned.

Note.—The black liquid mentioned is due to condensation in the chimney or smoke pipe, caused by the contact of the smoke and vapors with bodies that are colder than they. In a great number of cases this is due to a lack of draft and also to the size of the chimney. It has been asserted by some practical men who have had experience in this line that a chimney less than 8 x 12 will not give satisfaction where wood is used as a fuel. To prevent the drip coming to the outside of the pipe a common method of putting up the pipe is to reverse the connections, so that the smaller end of the pipe fits inside the stove collar and the other end receives the smaller end of the next joint of pipe, and so on to the chimney. This permits the condensation to run back toward the stove, without escaping at the joints.

Roofing Material Wanted.

From J. D. G., *Bozeman, Mont.*—In *The Metal Worker* of April 7, "M. H. R," Winnipeg, asks for suggestions on metal roofing. Without attempting to solve the problem, I would say that the climate he describes is the same as ours, and the roof that gives the best satisfaction here is the standing seam tin roof. The better the tin the better the results. Our roofs, however, do not give us half the trouble that the gutters do, and I would like to know the very best material for gutters, regardless of cost. How would aluminum do? Can it be joined or soldered? I would like to hear from "M. H. R." or any one else in regard to this proposition.

Note.—The soldering of aluminum is the difficulty met with in making use of that metal. There are roof compositions manufactured, however, into which aluminum enters, which we believe are easily soldered and worked like other metals. The quality in a roof material to be sought for in climates where there are great extremes of temperature is small expansion. Zinc, for instance, would be very difficult to handle in such a climate. We believe, however, that any metal can be laid with satisfactory results if an ingenious roofer will allow properly for the expansion and contraction of the sheets. For instance, the method of laying zinc in ordinary climates, if applied to tin plate in the climate of Winnipeg, would probably give good results. We will be glad to have our readers discuss this whole question.

From THE METALLIC ROOFING COMPANY OF CANADA, LIMITED, *Toronto, Ont.*—In your issue of April 7 we notice a letter from "M. H. R.," Winnipeg, Manitoba, respecting roofing material suitable for that climate, which varies from 50° below zero to 100° in the shade. We manufacture materials especially suitable for the Manitoba trade and have sold large quantities without receiving any complaints. It is a roof of sheet metal, and full information may be obtained from J. H. Ashdown, wholesale hardware merchant, Winnipeg, who is our agent.

Wants to Build a Fruit Dryer.

From C. O. F. Y., *Glendale, Ariz.*—I would like some information with reference to the construction of fruit dryers, using both hot air and steam, from the readers of *The Metal Worker* who may be engaged or have had experience in the construction of such apparatus.

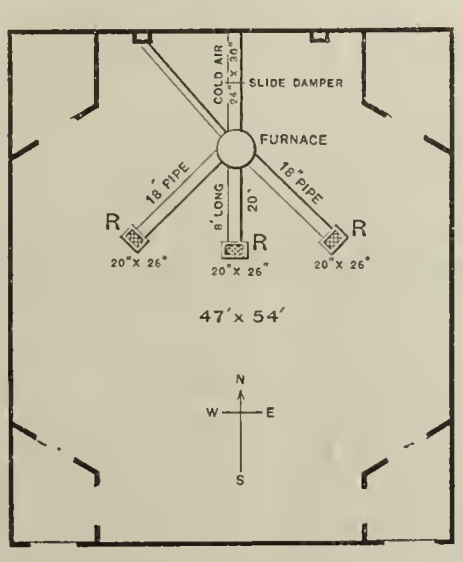
Sheathing for Tin Roofing.

From F. & H., *Brookville, Ind.*—In reply to the query from "B. J. P." in *The Metal Worker* of April 14, as to sheathing under tin roof, would say that tight sheathing would prevent tin from rusting on the lower side, but it would be more expensive than if the sheathing is laid a few inches apart, and it would be more difficult to work on a steep roof than if there was a space between the sheathing boards for a foothold. We use rosin sized or water proof paper under all our work and find that it prevents rust, is cooler in summer and warmer in winter, deadens sound and prevents drip of melting frost.

From C. F., *Erie, Pa.*—In reply to "B. J. P." of New York, in *The Metal Worker* of April 14, would say that by all means close sheathing is the best, at least when no felt is used. To illustrate the fact, only lately we had occasion to take off a tin roof for a new addition that had been on about five years on sheeting that was quite loose and having a good many knot holes, and as there was no felt on, we found that where the tin had been protected by the sheeting it was as bright as the day it was put on, while over the cracks and knot holes it was very rusty. I think there is the proof of the pudding. The only thing I would advise with close sheeting is to provide the attic with ventilation.

Wants Furnace Suggestions.

From A. L. F., *Roanoke, Va.*—In *The Metal Worker*, March 24, I notice that a Montana tinner asks for information in regard to setting his furnace. I submit a sketch and such information as I think would help him out in his dilemma. If I had the job of putting up this furnace I should locate it as shown by my diagram, taking it for granted that the south of the building was the entrance and north was the rear, and not built up against any other building in the rear. In the first place, three registers will equalize the distribution of the warm air in the room. The north and west side of the room will always be colder than the east and south. I would place the cold air flue on the north or northwest side of the building, which all furnacemen understand is the proper location. A damper should be placed in the cold air flue, as at times when the wind blows at a rapid rate it is necessary that some of the supply should be cut off, as a larger amount of air will be forced through the furnace than can be heated. By placing the furnace nearer the flue it will help the draft, and from the fact that the furnace is in the north of the building the hot air pipes can be extended some little distance without a material loss in heat. I would suggest that a round pipe be extended up the chimney, say, 10 or 15 feet, as large as the flue will admit (the entire length of the flue would be better), placing an elbow as large at one end as possible to receive the furnace pipe. Then plaster around the elbow, so as not to allow any air to enter the chimney flue without passing through the furnace. I should not advise using two flues. There might possibly be some trouble if one of the flues had a stronger draft than the other. Under some circumstances the one with the poorest draft would be a disadvantage.



Wants Furnace Suggestions.

I presume that soft coal is used from the size of the smoke pipe and the collar on the furnace. We are always ready to lay the blame on the chimney flue when the furnace smokes or there is a sluggish fire, though it is not always the cause of the trouble. If the furnaceman is a pretty good mechanic let him examine the check plates that are placed in the majority of furnaces and see if they cause the trouble. Some of the best makes of furnaces will not give satisfaction when using soft coal, owing to the draft of the chimney not being strong enough and the check in the furnace being too great. I have remedied three furnaces this winter that smoked so badly that the owners threatened to take them out, owing to the check being too great when using soft coal, causing them to smoke to such an extent as to be almost a nuisance. There is no danger in removing a portion of the check plate that the draft will be too great, as soft coal produces such an enormous amount of smoke and gas when it is first thrown in the furnace that it is almost compelled to force its way out through the door or some other part of the furnace that is not perfectly air tight, unless there is ample outlet for it to escape to the flue. In the matter of the cold air flue, as shown on his diagram, it seems to me to be a very bad idea to take the cold air from the main auditorium. While some furnacemen suggest this plan, the fact that the air is being reheated and sent back into the room to be inhaled, possibly a dozen times during services, does not commend itself to me as being the proper way to get fresh air, which is so essential where there is a large number of people. Although those who approve this plan contend that the air is purified by passing through the furnace, I have other ideas.

Material for Roof Gutters.

From L. H., *Masontown, Pa.*—I would like to know which is the more lasting for roof gutters—copper of ordinary thickness or the best grade of roofing tin.

Answer.—Roofing tin, as our correspondent knows, is sheet iron, or rather steel coated with a mixture largely composed of lead. The finished plate, therefore, is equivalent to a sheet of iron and two thin sheets of lead alloy. Copper is a single homogeneous metal. Assuming that the copper that our correspondent has in mind is of the same thickness as the finished plate of roofing tin, it is evident that copper will prove the more lasting material. The length of life of the roofing plate, of course, depends upon the endurance of the lead coating. When this is worn away, abraded, or injured in any way, the iron or steel quickly rusts through. We do not know the relative endurance of lead and copper. Suffice it to say that roofs covered with lead sheets or copper sheets will last indefinitely. It

is of little consequence in modern building construction whether a roof gutter lasts 150 or only 100 years. In either case it will be apt to outlast the house itself, so it is needless to define the exact limit of endurance. We have no doubt that if our correspondent uses the best terne plates for his roof gutters he will find they will prove very durable.

Ohio Sheet Iron Trade.

In sheet mills in Central Ohio and adjacent districts there is a much better feeling prevailing. Jobbers of the West, Northwest, and South are sending their inquiries broadcast asking for prices for summer and fall delivery, and they appear to have realized that bottom has been reached. If this is not a fact and prices do go lower they will hug the cost marks so closely that there will be no margins for contingencies, and a few breakages or stoppages will wipe out the small profits, obtainable only under the most favorable conditions. Considering the fact that jobbers are in the market and that the roofers are doing better business, there ought not to be any further decline in sheet iron prices. The fact that the fine weather of the past two weeks has stimulated building operations is given as a cause for improvement in the iron and steel roofing trade. At Canton, Wheeling, Cambridge and Cleveland it is reported that inquiries are more numerous, and more sales are resulting than at any time for six months past. The demand for conductor pipe, eaves trough, and other building material made from galvanized iron is particularly good, and rolling mills appreciate this fact. The bulk of the trade in roofing and corrugated sheets is in light gauges for small consumers. Orders for heavy gauges are few and far apart. This is accounted for by decreased construction of buildings for manufacturing purposes. An order for about 30 tons of Nos. 18 and 22 corrugated for covering the buildings of the Canton Rolling Mill Company, Canton, Ohio, was placed with the Canton Steel Roofing Company; the black sheets will be made at New Philadelphia. The buildings referred to will contain sheet mills, and it is estimated that the entire product will be consumed by home concerns.

According to the lately published census returns, the total valuation of property in the United States in 1890 was $65,037,091,197, which was an increase of 49.02 per cent. over the returns of 1880, representing a per capita sum of $1039. That the growth of the wealth of the country during the past five decennial periods has proceeded at a much higher ratio than the increase in population is shown by the following figures: In 1850 the total valuation of property in the country was a little over $7,000,000,000, or $308 per capita. In 1860 it was $16 000,000,000, or $514 per capita. In 1870 it was $30,000,000,000, or $780 per capita, and in 1880 it was $43,500,000,000, or $870 per capita. New York stands as by far the richest State, its wealth being estimated at $8,500,000,000. Pennsylvania comes second, with $6,000,000,000, and Illinois third, with $5,000,000,000.

Ground was broken on April 18 for the work of sewering the city of New Orleans.

Borough Polytechnic Institute, London.

In the early part of last year we presented an account of the then recently started trade training classes held in connection with the Borough Polytechnic Institute of London, England. This institute was the first established under an act of Parliament passed in 1891 to encourage technical education in Great Britain. It was opened in September, 1892, by the Earl of Rosebery, the present Prime Minister of England, with well equipped classrooms, halls, laboratories and offices for the efficient conduct of the general technical education and recreative advantages which it was designed to provide for the working men and women of the South London district, in which it is located. Its courses of instruction cover a very wide field, embracing the teaching of subjects to suit all trades and classes, thus aiming to promote greater industrial skill and general knowledge among the younger working people of the British metropolis.

Trade Classes.

Among the principal educational departments of the Borough Polytechnic Institute are the classes for practical and theoretical instruction in various trades. These trades include plumbing, sheet metal working, carpentry, engineering, blacksmithing, pattern making, bricklaying, bookbinding, &c. Instruction is only given to those already engaged in these trades, and is arranged to supplement the training of the factory or workshop and not to supersede it. For this reason no student is admitted for trade training only, but is expected to join at least one of the science or art classes, such as the elementary science class or the classes in practical geometry or technical drawing, which are open on nights other than those devoted to trade instruction. Thus it is intended to give the mechanic an all round training which will help him in his trade, by stimulating his mental faculties as well as his manual capacity.

The New Workshops.

The trade classes were at first housed, as a temporary measure, in the original institute building, until adequate accommodation and facilities could be provided. They soon outgrew the space there at their disposal, and it was decided to at once erect new workshops for the trades in a separate building. This was done, and the shops were completed and opened for use in March of this year. The plan view, presented herewith, gives a good conception of the arrangement of the different shops. All, with the exception of the bricklayers' and bookbinders', are top lit with lantern lights, the side sashes being hinged to open for ventilation. They cost $15,360 to build and nearly $6000 to equip. The students of the trade classes assisted in the work of furnishing and fitting them; sheet metal workers, carpenters, bricklayers, &c., contributing their labor and skill with good effect.

Progress of Trade Training.

The new and more capacious accommodation thus provided enables the managers of the institute to largely develop and extend the work of the trade classes, which have been found to meet a very pressing need in South London. Eighteen months of work have shown that the advantages offered are eagerly grasped by the class for which they were intended. The entries in the trade and technical classes for the first session were 497. In the last session—October, 1893, to May, 1894—they numbered 701, an increase of 264, and the prospects are that the next courses will be still more numerously attended.

Plumbing Instruction.

Instruction in plumbing is given on three nights of the week: Tuesdays, Thursdays and Fridays. The full curriculum extends over three years. The first year's course is a preliminary and general one, consisting of instruction in practical geometry, technical drawing, freehand and model drawing, and elementary mechanics, including mensuration This course is planned to serve as a preliminary for those about to enter or who are already engaged in any of the trades. Students, however, who have a knowledge of any two of the above named subjects are allowed either to take up other subjects or else to pass at once to the second year's course of the trade in which they are employed. In the plumbing trade, the further courses are arranged as follows:

SECOND YEAR'S COURSE.

Mondays, 8 to 10 p.m., plumbers' work (technical).
Thursdays, 7.30 to 10 p.m., special preliminary science course (lectures and laboratory work).
Fridays, 8 to 10 p.m., plumbers' work (practical).

THIRD YEAR'S COURSE.

Tuesdays, 8 to 10 p.m., plumbers' work (advanced technical).
Thursdays, 8 to 10 p.m., plumbers' work (advanced practical).
Fridays, 8 to 10 p.m., building construction and special lectures.

These courses, consisting of lectures and workshop practice, comprise instruction in lead bossing, pipe bending, soldering and wiping joints, &c.; lectures on sanitary arrangements in dwelling houses and other buildings, water closets and their fittings, baths, traps, lavatories and sinks; soil pipes, their ventilation and arrangement; water supply, house cisterns, roofing, &c.

In addition, a special class for journeymen and foremen plumbers and others engaged in the building trades is held on Monday evenings from 7.30 to 9 o'clock, when instruction is given in "builders' quantities," including measuring work, taking off quantities from drawings, squaring dimensions, and bringing the same into bill ready for pricing out to form a builder's estimate.

Sheet Metal Work.

The preliminary or first year's course for sheet metal workers in tin plate, zinc, iron and copper, lamp makers, boiler makers and coppersmiths is similar to that detailed for plumbers. The second and third year's courses are laid out respectively as follows:

SECOND YEAR'S COURSE.

Mondays, 8 to 10 p.m., metal plate work (technical).
Thursdays, 7.30 to 10 p.m., special science course.
Fridays, 8 to 10 p.m., metal plate work (practical).

THIRD YEAR'S COURSE.

Mondays, 7.30 to 10 p.m., machine construction and drawing (for iron workers and boiler makers).
Tuesdays, 8 to 10 p.m., metal plate work (technical).
Thursdays, 8 to 10 p.m., building construction and drawing (for zinc workers).
Fridays, 8 to 10 p.m., metal plate work (practical).

The instruction includes geometry and its applications to pattern cutting;

patterns for elbows, T pieces, round, oval, oblong and other articles of equal and unequal slant; tea bottle top, bath and hood patterns by long and short radius methods; cowls, ships' ventilators and patterns for boiler makers; seams riveted, grooved and soldered; solders and soldering, composition of useful alloys, tinning and galvanizing processes; the properties of iron, steel, tin, lead, copper and zinc; theory and practice of hollowing, raising and planishing metals.

The new laboratory and workshop for metal workers is fitted up with all the necessary appliances for practically carrying out the above courses. During the session lectures on metals and other cognate topics are given by C. T. Millis, M. I. Mech. E., principal of the education department. It is to Mr. Millis we are indebted for the information here given.

Fees for Instruction.

As the benefits of the institute are intended to reach apprentices and workers in receipt of a small weekly wage, the class fees are fixed at an exceedingly low rate, ranging from $1 to $2.50 for each yearly course, so that the best instruction is placed within easy reach of all who are desirous of availing themselves of it. Moreover, students under 19 years of age are admitted at half these fees, and members of the trade classes may enter classes in other subjects at half fees.

Certificates and prizes are awarded by the institute to the students who are found proficient; examinations being held at the end of each session by representatives of the Science and Art Department of the city and guilds of London Institute and the Society of Arts.

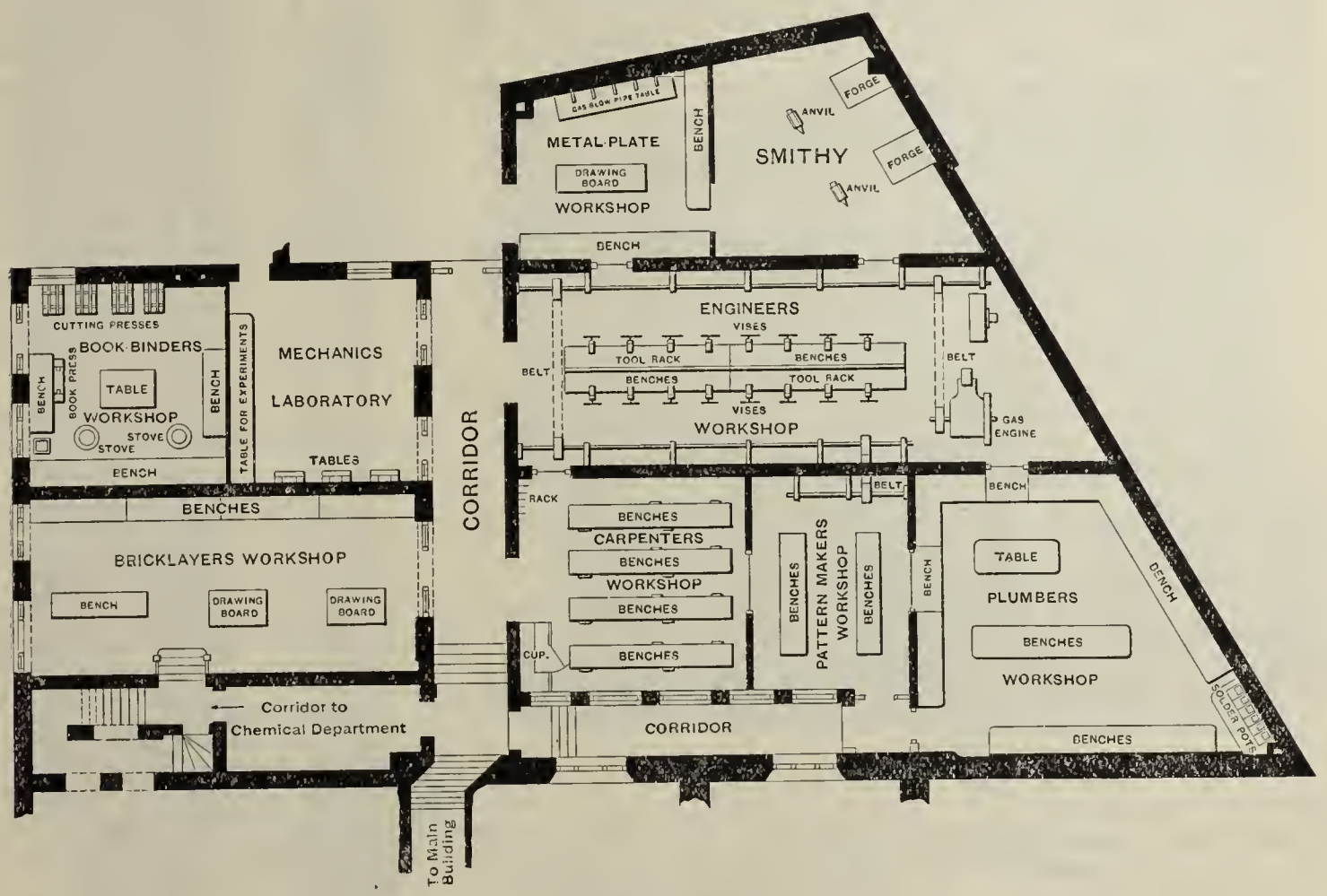
The institute is under the direction of an able and experienced body of technical educators, and the trade classes are taught by master workmen of the respective crafts. The work already done by the students is said to be of a most creditable character. Specimens executed by the classes were on exhibition on the night of the recent opening, and were very favorably mentioned by the various London trade journals.

New Publications.

ELEMENTARY METAL WORK. A Practical Manual for Amateurs and for Use in Schools. By Charles Godfrey Leland, late Director of Industrial Art Work in the Public Schools of Philadelphia. Macmillan & Co., New York, 1894. $1.50.

In this volume Mr. Leland has put into the hands of students of art metal work a manual which appears to be a very complete and helpful guide to the mastery of this fascinating craft, beginning with its first principles and carrying the instruction through to the highest stages. Although designed, as its subtitle indicates, mainly for use in schools and for the benefit of the amateur metal worker, the book goes very thoroughly into the art of decorative working in sheet metals, and contains much matter which would render it useful to practical metal workers. The book is devoted to an exposition of the processes of cold metal work, beginning at the rudiments and working steadily along into the most advanced forms of artistic and decorative work. It is divided into six portions, treating respectively of bent iron or strip work, flat sheet metal work, molded sheet metal work, *repoussé* or embossed metal work, ornamental silver work, and nail, scale and stencil work. The illustrations, 124 in number, are of excellent quality, and include engravings of all the tools and appliances used in the manipulation of cold metals, samples of elementary forms and curvatures, and a wealth of artistic patterns, with examples of the best ancient and modern metal work. Directions are given for making rings and curves of strip metal into objects; for soldering, shearing, chiseling, fret sawing and pressing sheet metal; for embossing sheet metal on wood and on pitch, and for every phase of cold metal working. The book contains 110 pages, is handsomely gotten up on thick paper, and bound in an artistic cover of black and bronze, making it a very attractive volume.

S. J. Seneca, Havre de Grace, Md., who in 1873 adopted as a trade-mark for his canned goods the words "Red Cross Brand," and the emblem of a red cross, which latter was registered as a trade-mark at the Patent Office in 1876, is naturally much disturbed over the bill prohibiting the use of the red cross as a trade-mark or designation. Mr. Seneca thinks that as the American Association of the Red Cross Society was not formed until 1881, his prior right in this matter should receive consideration from Congress. A trade-mark is at times a very valuable piece of property, and the interference by Congress with established rights in a matter like this would, we think, only be justified by a proper compensation.



Borough Polytechnic Institute, London.—New Workshops.

The annual prize given by the French Society for the Encouragement of National Industry for the Utilization of Waste Products has been awarded this year to a Mons. Martinon for his process of recovering the tin from water in which silks have been treated with bichloride of tin for the purpose of imparting weight. By adding milk of lime to the water and by properly agitating it the tin settles down in a few hours, in the shape of oxide, and can be readily collected and utilized.

STEAM AND HOT WATER.

Estimating Surface Required.

From T. A. A., *Pennsylvania.*—Will *The Metal Worker* please answer the following questions on steam heating? Is it a good rule to multiply the length of a building by its breadth and the results by its hight, then strike off the two right hand figures and count the remainder as the number of square feet of surface required to heat it? Please publish a good rule for estimating the amount of radiating surface to be used for the space to be heated. What difference should be made in estimating for low pressure steam and for hot water in house heating? How many feet of 1-inch and 1¼ inch pipe should be used for 100 cubic feet of space?

Note.—It is probable that the secret of success in house heating is in correctly estimating the surface and properly piping it. No one rule is applicable to all kinds of buildings, whatever its basis may be, and of those in use none needs so much judgment in their application as the cubic foot rules. The rule given allows 1 square foot of surface for each 100 cubic feet of space, and for stores, halls and churches this might give satisfaction. For use in house heating it would in most cases prove unsatisfactory, as a wide variation is found necessary. Sometimes 1 square foot of surface is used for 70 cubic feet of space when the rooms are small and so located that but little heat is required; and often 1 square foot of surface is used for as little as 30 cubic feet of space when the rooms have a large glass surface and are much exposed. About 3 lineal feet of 1-inch pipe and 2⅓ feet of 1¼-inch pipe expose 1 square foot of surface, and in a room 15 x 15 x 10 feet, allowing 1 foot of surface to each 50 cubic feet of space, 45 square feet of surface would be necessary, requiring 135 lineal feet of 1-inch pipe, or 105 lineal feet of 1¼-inch pipe. This is equivalent to 6 feet of 1-inch pipe or 4⅝ feet of 1¼-inch pipe to 100 cubic feet of space. As our correspondent wishes to learn how to estimate surface, we would refer him to "The Metal Worker House Heating Essays," which give a number of different rules that have been used by different authorities for both steam and hot water.

Mixing Valves.

BY HELIOS.

Fig. 1 shows the manner of connecting a mixing valve for indirect radiation. In Fig. 1 the arrangement and connections to the indirect radiators are the same as shown in a previous article. The cold air supply, as shown in Fig. 1, is taken from above the grade and carried down and through the wall of the building. An elbow is placed on the end to keep the rain from falling into the pipe. An iron ring made from ¼ x 1-inch iron is covered with wire screen and cemented into the elbow. The elbow on top and the pipe down and through the wall are vitrified sewer pipe. The pipe connecting to the indirect radiators is made of galvanized iron.

In making the mixing valve connection take a branch the full size of the cold air pipe from the top of the cold air pipe as it enters the cellar. Start with a round pipe and form into a square pipe at the mixing valve. The opening from the indirect radiator must be full size of hot air pipe. Make a damper of galvanized iron and have it lap over on all sides of the opening from the indirect radiator ⅛ inch. Take a piece of round iron flat in the middle and bolt to one side of the damper as shown in Fig 2. On the outside of the hot air pipe place a crank and secure to the damper rod with a set screw, and from the end of this crank run a chain over pulleys up to the room with which the indirect radiation is connected. The chain can have a ring on the end and brass hooks to hold the chain.

A mixing valve connected to indirect radiation is used to regulate the temperature of the air entering the room from the indirect radiators. In Fig. 1 the mixing valve is closed, and all the air passing into the room that this radiator is connected to has to pass over the radiators in the box. If the room is too warm, by drawing up on the chain it will allow the cold air to enter the hot air pipe, which will lower the temperature of the air entering the room. If only cold air is wanted, draw the chain all the way up, and the damper will close the opening from the indirect radiators to the hot air pipe and open the cold air pipe wide open.

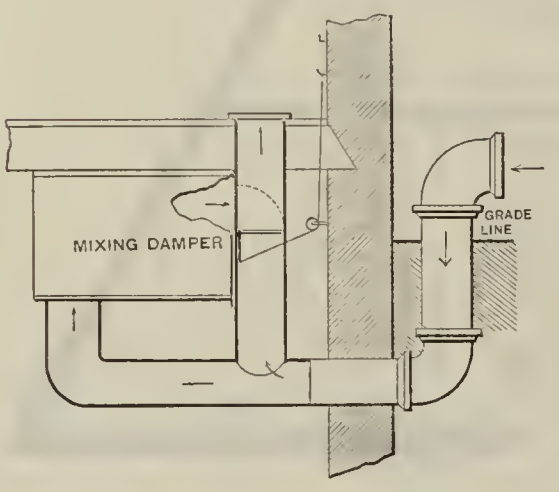


Fig. 1.—Mixing Valve Connected for Indirect Radiation.

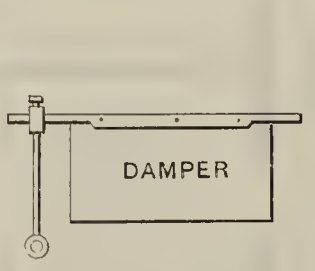


Fig. 2.—Galvanized Iron Damper.

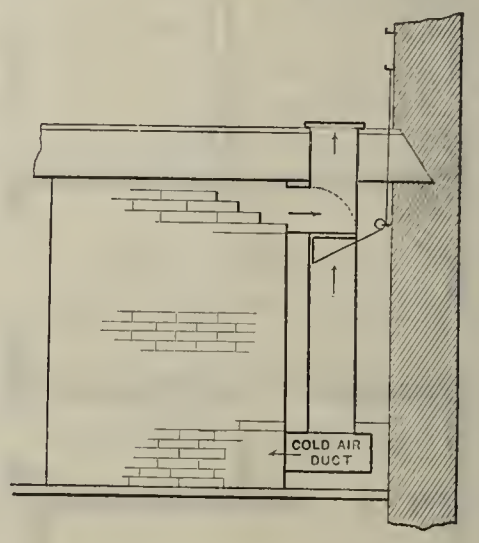


Fig. 3.—Brick Chamber for Indirect Radiation.

MIXING VALVES.

Fig. 3 shows indirect radiation built in with brick work, with cold air duct and mixing valve outside the brick walls. The brick work from the floor to the under side of the radiators should be 8-inch walls and above the supporting bars 4-inch walls. Cast iron doors and frames should be built into the brick work above and below the radiators. The mixing valve is connected the same as in Fig. 1.

Heating Coils in Furnaces.

From C. O. F. Y., *Glendale, Ariz.*—I have just read the article on heating coils in furnaces in *The Metal Worker* of April 7, by an unknown correspondent, which sets forth some excellent ideas. It is the successful accomplishment of such work as described that makes the distinction between the expert and the novice, and the man who relates his experience as minutely as has been done in this case for the guidance of the craft receives their appreciation, although he very seldom hears of it.

Scollay Hot Water Thermometer.

The illustrations herewith show a new hot water thermometer being brought out by John A. Scollay, 74–76 Myrtle avenue, Brooklyn, N. Y. It consists of a nickel plated case with a dial and the expanding liquid, as shown in Fig. 1. A thermometer is shown in Fig. 2 which may be conveniently carried in the pocket, or is less conspicuous in use as is sometimes desirable.

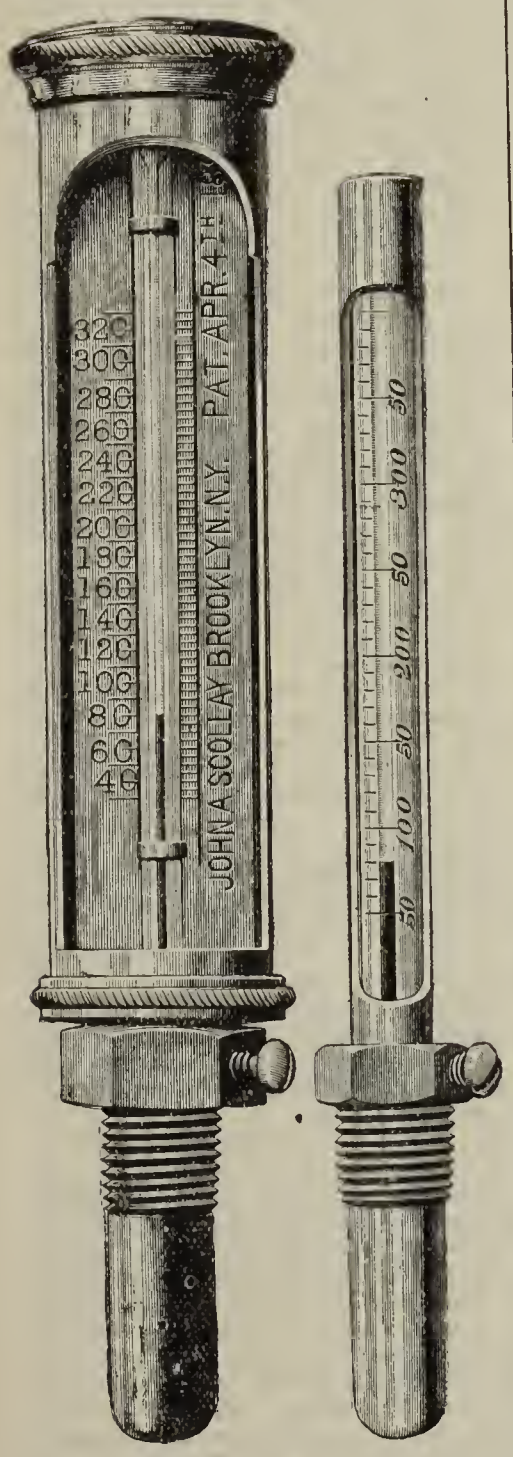


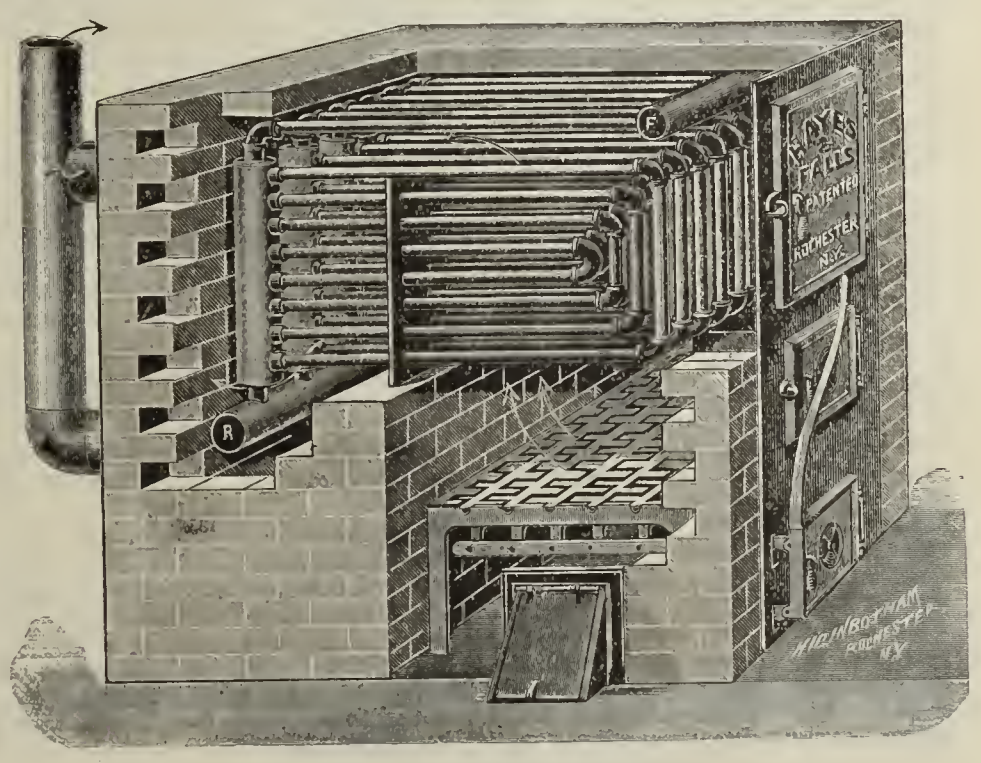
Fig. 1.—Thermometer for General Use. Fig. 2—Pocket Thermometer.

Scollay Hot Water Thermometer.

The features of the thermometer are size of threaded part, which is made to fit a ¼-inch opening, and the fluid. A set screw at the side releases or fixes the thermometer in the threaded part, enabling that part to be readily set in the system. This part has a thin shell exposed to the water and is filled with mercury. The glass tube holding the expanding fluid is protected by a brass cylinder with a space around it. This portion extends down into the mercury. The fluid used is black and is adapted to registering temperatures as high as 500°. The black color, it is said, is permanent, so its hight on the white dial can be readily seen from the strong contrast.

The Torrent Steel Water Tube Boiler.

The accompanying illustration shows the Torrent steel water tube boiler with the brick casing partly removed. The boiler, which is intended for heating with steam or hot water circulation, is manufactured by Hayes & Falls, 290 State street, Rochester, N. Y. As shown in the illustration, it is intended for hot water, the same design, with trimmings, being adapted for steam. The boiler, it will be noticed, consists of a series of horizontal 1-inch tubes fastened into vertical cast iron headers 3 inches in diameter, the horizontal tubes being, furthermore, connected by short pipes or return bends at the outer ends. These vertical headers at the top are connected by 1¼ or 1½ inch tubes, according to the size of the boiler, with a 4-inch horizontal flow header, F. The lower ends of the vertical headers are connected with the return header R, a horizontal 4-inch pipe. It will be noticed that back of the furnace is a bridge wall, and above the bridge wall is a baffle plate to make the hot gases and products of combustion pass over all the tubes. It is said that circulation in the Torrent boiler is not interrupted by conflicting currents, the water through the lower pipes passing horizontally over the fire, then up and back through upper tubes to the vertical headers, from where it is carried into the main flow header F. There is an arrangement at the back for direct draft when starting the fire. The boilers are brick set and have large clean out doors at the back and front, so that the soot can easily be removed from the tubes. The manufacturers publish the result of a test, stating that the evaporative power of the boiler from steam at 213° to water at 212° was shown to be 11¼ pounds of water to 1 pound of coal. The boilers are made in nine sizes, with grate from 20 x 13 inches to 27 x 36 inches, with heating surface exposed to the fire from 48 to 193 square feet, adapted to carry from 413 to 1737 square feet of direct water radiation and 336 to 1451 square feet of direct steam radiation.



Torrent Steel Water Tube Boiler.

Papers by Master Fitters.

Some excellent articles have been prepared for presentation at the convention of the Master Steam and Hot Water Fitters' Association of the United States, which is to be held at the Broadway Central Hotel, New York City, June 19 and 21. The following are some of the papers, there being others promised, but of which the titles have not yet been made public:

"Warming and Ventilation," by David M. Nesbit, London, England.

"Difference in Radiating Surface Required to Warm Buildings of Poor and Good Construction," by E. P. Bates, Syracuse, N. Y.

"Types of Heating Boilers Used in the United States," by Arthur C. Walworth, Boston, Mass.

"System in Office and Drafting Room," by H. T. Crane, Cincinnati, Ohio.

"Early Reminiscences in Hot Water Heating," by John B Farnsworth, Leominster, Mass.

HEATING NOTES.

The New York office of the Huyett & Smith Mfg. Company has been removed to the Havemeyer Building, 26 Cortlandt street, where General Eastern Manager J. R. Wendover is prepared to talk heating and ventilating apparatus to all interested.

William H. Oakes, formerly manager of the New England branch of the American Boiler Company, Boston, has retired from that position and bought a partnership in the established firm of Buerkel & Co., steam contractors, 28 Union Park street, Boston. Mr. Oakes' successor in the American Boiler Company has not yet been appointed.

The New England Engineering Company, Boston, Mass., issue a circular printed in two colors relating to the Paul system for utilizing and circulating exhaust steam. The circular is prettily printed and the text is of an entertaining sort.

The Gorton & Lidgerwood Company, 96 Liberty street, New York City, manufacturers of the Gorton house heating boilers, will shortly issue a new edition of their book, "Modern House Heating," which bids fair to be in gen-

eral demand. The work typographically will be a work of art and will contain a fund of practical information as to the best manner in which to heat dwellings and other structures efficiently and economically.

JOHN SIMMONS COMPANY, 110 Centre street, New York, are making a large shipment of pipe and fittings to the Chino Valley Beet Sugar Company of California. The pipe, a large portion of which is 12 inches in diameter, and fittings fill several carloads. They are also cutting to specification the pipe for Cornelius Vanderbilt's residence, The Breakers, at Newport, R. I., and for John D. Clarke, 276 Water street, who is installing the heating plant. The fittings for this job are all specially made and some of these pipes are 18 inches in diameter.

D. R. MCJALLUM, formerly manager of the National Hot Water Heater Company and later of the American Boiler Company on the Pacific Coast, is coming to New York to assume the management of the branch office of the J. H. McLain Company, Canton, Ohio, makers of the Canton heater for hot water, steam or hot air.

THE NEWEST ATTRACTION shown by Albert Cryer & Co., heating engineers and contractors, at 85 Centre street, New York, is the No. 327 Richmond sectional boiler. This boiler occupies a space on the floor 5 x 8 feet and stands 7 feet 9 inches high to the top of the steam gauge. The sections are 3 feet wide and 5½ feet high. The boiler shown is the largest size, composed of 12 sections, and is rated to carry 2100 feet of steam radiation or 3300 feet of hot water radiation, and has fire chamber 27 x 57 inches. The boiler is arranged with direct draft or has a full diving return flue. The bottom water section of the boiler forms the bottom of the ash pit, and beneath this three flues are arranged as in a flat top cook stove. The indirect draft sends the smoke and gases to the back and then down to the bottom flue, where they pass to the front at both sides and return to the smoke outlet through a central flue. The boiler is set up complete, with the exception of the asbestos covering, and has a steam gauge and automatic draft regulator.

IRON, STEEL OR BRASS PIPE is bent into any shape desired by the Brooklyn Tube Bending Company, 48 and 50 Ross street, Brooklyn, N. Y., a specialty being made of galvanized coils. They have special patented machinery for the purpose and furnish coils for radiation. They make coils to be used for water heating in connection with furnaces where they are suspended over the fire and the water passes through them. They also make coils for heating water in tanks where the coils are immersed in the tanks and steam is passed through them.

C. F. GESSERT, 42 Dey street, New York, has just completed a renovation of his showroom, and is about to make a fine display of radiators, direct and indirect; flue, prime and extended surface for steam and hot water

THE SYSTEM of heating by steam and the method of installation used in the United States are attracting considerable attention abroad, and the American Boiler Company of 94 Centre street, New York, frequently prepare plans for buildings on the other side of the water. A feature of the plans which their engineer, W. A. Russell, makes is to have the flow pipes distinctly marked with red and the return pipes all marked in blue, making a very pretty effect.

A. S. LIGHT & Co. are a new business firm who will soon make their appearance at Saginaw, Mich. The company will do steam and hot water heating and plumbing and have rented the upper store of the D. H Jerome Building on Court street, which they will open about May 1.

THE CHICAGO ENGINEERING & SUPPLY COMPANY are to move from 108 Lake street to more commodious quarters at 167 and 169 on the same street. The company have the agency for and will carry a full stock of the Standard Radiator Company's goods.

THOMAS E. CRONE, manager of the American Boiler Company's New York office, has been in Chicago for a few days.

THE CHICAGO OFFICE of the Holland Radiator and Mfg. Company will be moved May 1 from 89 to 75 and 77 Lake street.

BLAKE & WILLIAMS, manufacturers of and contractors for steam and hot water heating and ventilating apparatus, will move to 186 and 188 South Fifth avenue, New York, about May 1. They have taken a large six-story building and will put in new pipe cutting machinery and increase capacity in their line of work.

CHARLES A. LATHROP, New England manager for A. A. Griffing Iron Company, reports himself now "at home" to all steam fitters at his Boston headquarters, 177-179 Fort Hill Square.

A GREAT DEAL is claimed by the Peerless steam house heater people for the simplicity, uniform heating power and cheapness of their apparatus. Their catalogues contain many excellent testimonials from people using the heater. George H. Bell & Co., 114 and 116 Nassau street, are sole agents for the United States.

THE LAST NUMBER of the German Valley *Quarterly*, German Valley, N. J., for April, 1894, contains an illustration and full description of the Florida heater, for which the F. D. Stephens Company are general agents for central and northern New Jersey.

FRANK W. SOMERS will soon move to his larger and more commodious quarters, 34 Dearborn street, Chicago, where he will have the entire store in which to show samples of the Bundy radiators and specialties. A. A. Griffing Iron Company were compelled to give up their place at 88 Lake street, as the half store there occupied was not large enough.

AMONG newly chartered corporations in New York State is the Queen City Radiator Company of Buffalo, of which the directors are W. F. Bryant, Orrin Bryant, Wm. H. Harrell of Buffalo and others. Capital, $300,000.

THE NEW YORK WARMING & VENTILATION COMPANY, with a capital of $50,000, have been incorporated at Albany, N. Y. The directors of the concern are W. F. Wolf of Boston, H. M. Caswell of Troy, N. Y., and Wm. H. Knowlson of Peekskill, N. Y.

ARTICLES have been filed with the Secretary of State for the incorporation of the Milwaukee Steam Heating & Electric Construction Company, at Milwaukee, Wis.; capital, $2500; incorporators, Henry Jane, George C. Kuntz and George Crooks.

SECRETARY GEORGE H. REYNOLDS of the Master Steam and Hot Water Fitters' Association moved yesterday to his new quarters, Rooms 324 and 325 Broadway Central Hotel, at 667-677 Broadway, near Bleecker street, New York.. This will be his headquarters until the convention in June.

THE S. WILKS MFG. CO., 115 to 123 South Clinton st., Chicago, have issued a 28 page catalogue of the Wilks hot water heaters, steam generators, steel tanks, &c. The water heaters shown cover quite a variety, from small sizes for conservatories, baptisteries, poultry houses, carving tables, &c., to large ones for heating water for hotels, bath houses, apartment buildings, &c., and for heating dwellings, churches, stores and large buildings of all kinds. The large sizes are self feeders, being provided with a coal magazine. These water heaters are of a peculiar type, the fire being completely surrounded by water and the motion of the water being entirely vertical. Hot water tanks as manufactured by this company are either upright or horizontal. The Wilks steam generators, for heating dwellings, stores and large buildings, or for cooking feed, &c., are provided with coal magazines. Both the hot water heaters and steam generators are arranged with sad iron heaters around the base when desired. The catalogue thoroughly explains the construction of the company's heaters, gives full price-lists and also presents a large number of testimonials from those who have the heaters in use.

THE FOWLER RADIATOR & MFG. COMPANY is a new organization at 435 North Broad street, Philadelphia, Pa., who will continue the radiator business which was formerly conducted by H. Belfield & Co., who make a specialty of steam and water valves. The demand during the past season for their radiators has exceeded their facilities for production, and arrangements are being made for an enlargement of their plant such as will enable them to fill their orders promptly. They say that the Fowler radiators have already taken a place in the front rank, and the result of their last year's business has been very gratifying.

Thos. Fletcher of Warrington, England, writes to the *Gas World* as follows: "It is not generally known that the quality of ordinary writing ink depends on the gas supply. The best black inks are made from galls, and the use of vegetable (oak) galls has been superseded for many years by dried animal galls, which come almost exclusively from China. These are roasted in revolving cylinders, in charges of about 2 hundredweights, at a temperature of 300° F., and as the exact temperature is a matter of the utmost importance, gas is exclusively used for the purpose. The burners have an average consumption of 200 cubic feet per hour, and in an ordinary ink manufactory the work is considerable. As with mustard, the demand is created rather by what is dried up and wasted than by what is used. This is one of the apparently small industries which are in reality large; and help to swell the receipts of the gas companies for other and more regular purposes than lighting."

The employees of the Passaic Zinc Company's works in Jersey City, N. J., were informed last week that the 10 per cent. taken from their wages last December would be restored to them on May 1.

SCRAP.

THE PROJECT, to which reference was made in a late issue, of erecting a large tin plate works at Washington, Pa., has, we understand, taken definite shape. A company has been organized with a minimum capital of $250,000, all the plans have been prepared for a complete modern tin plate plant, and the ground for its erection has been secured. The town of Washington, Pa., has been fixed upon for its location, and citizens of that place have subscribed for a large number of shares in the enterprise. The actual commencement of building operations will depend largely upon the course of tariff legislation. N. E. Whitaker of the Whitaker Iron Company, Wheeling, W. Va., is at the head of the enterprise, and is said to be backed by some prominent members of the metal trade in New York City.

SAUNDERS, FIELDING & BOND, importers and dealers in tin plates and metals, have removed their office from 284 Pearl street to the Downing Building, 108 Fulton street, New York City. The firm are agents for the Pontymister Tin Plate Works of Newport, Wales. They have also offices at Swansea, Wales, and at Chicago, 419 Ashland Block, in which city they are the selling agents for the Morewood Tin Plate Company of Gas City, Ind.

REPORTS of projected tin plate plants are rife at the present time despite the uncertainty regarding the tariff. A late dispatch from Marion, Ind., announces that a large works, to cost $100,000 and to employ 300 men, is to be established at that place by E. Stanford.

AT MARSHALL BROS. & Co.'s mills, Philadelphia, the demand for black sheets for tinning purposes is crowding the establishment to the limits of its capacity.

ALL the Western tin plate works are reputed to be running to their fullest capacity on orders for American roofing plates. The main difficulty encountered in supplying the awakened demand is that of obtaining enough domestic black sheets. All the mills rolling this product are said to be behind their orders. Many have enough work on their books to keep their rolls in full work until the end of July. This is the case with the Eastern as well as the Western mills.

A WELSH tin plate manufacturer just arrived in New York City speaks of the present situation of the British tin plate trade in anything but cheerful terms. More than half the Welsh mills are idle, and prices are so low that profits have almost reached the vanishing point. Probably 5 cents per box is the outside gained by the average manufacturer, and even this modest profit is not easy to be obtained. Buyers' offers are as often as not below the actual cost of production.

THE United States Consul at Cardiff reports to the State Department a great reduction in the exports of British tin plates for the first quarter of this year, amounting to 22,500 tons, as compared with the corresponding period of 1893. During March this year the United States took only 16,997 tons of tin plates and sheets, while last year the amount for March was 31,334 tons. The exports were diminished to Argentine Republic, Brazil, France, Italy, Russia, Germany and Portugal, and increased to British North America, Australasia and several other countries.

THE MONTPELIER SHEET & TIN PLATE COMPANY of Montpelier, Ind., was incorporated on the 19th inst. with a capital stock of $200,000. The stockholders are Monroe Seiberling and Charles A. Ford of Kokomo, and Carl W. Kolbe, Daniel A. Walmer and David Moser of Montpelier.

Sizes of Furnace Pipes.

BY A. W. GLESSNER,

President of the Excelsior Steel Furnace Company, Chicago.

The time is near at hand when building will commence throughout the country and furnace dealers will begin their annual campaign. It may be opportune, therefore, to call the attention of the trade to the importance of careful figuring in regard to the sizes of furnace pipes, &c., to be used in the work in prospect. A great deal has been written and published on this subject by *The Metal Worker* during the past five years, and it would not be unreasonable to suppose that almost every furnace dealer has a fairly correct idea of the sizes of pipes and registers necessary for the efficient heating of rooms of a given size, but such does not seem to be the case. A short time ago the writer saw an estimate made by a Western furnace dealer for heating an elegant residence in his town, and that he was very anxious to obtain the contract for the heating of this building was shown by the detailed plans and specifications which he had gotten up and evidently submitted to the owner. On the second floor there were six chambers and a bathroom, varying in size from 4 feet 6 inches x 11 feet to 17 x 19 feet, and to heat these apartments the aforesaid furnace dealer had planned to use 4 x 10 stacks and 8 x 12 and 8 x 10 registers, irrespective of the varying sizes of the rooms. Comment on the result of such a job if put in according to these plans would be superfluous.

I append to this article a table which, while only approximate, may be found of considerable value to dealers who have not some such table evolved from their own experience. There is nothing particularly new in this table, but I do not remember having seen it in print in any of the trade journals. Any one using pipe according to this schedule in buildings within 100 miles of the forty-second parallel cannot go very far astray. It will be noticed, however, that comparatively few dealers or furnacemen use quite as large sizes of riser pipes as those referred to in the table, and possibly not a little of the trouble in heating chambers might be traced to the use of stacks too small in size. No table could be made to cover the ever varying conditions under which furnace pipe works, and I would therefore say that this table is based on normal conditions with runs of pipe of usual length and is intended to show the size of registers and pipes necessary to raise the temperature of air from zero outside to 70° on the inside within reasonable time without forcing. The sizes that are marked with an asterisk are those recommended for general use. The larger the register the less resistance to the flow of the heated air, but sizes mentioned will produce good results.

Size of register.	Equivalent in round or leader pipe.	Equivalent in square or riser pipe.	Cubic feet of space on first floor same will heat.	Cubic feet on second floor.	Cubic feet on third floor.
	Inch.				
6 x 8	6	4 x 8	400	450	500
*8 x 8	7	4 x 10	450	500	560
*8 x 10	8	4 x 10	500	850	880
*8 x 12	8	4 x 11	800	1,000	1,050
*9 x 12	9	4 x 12	1,050	1,250	1,320
*9 x 14	9	4 x 14	1,050	1,350	1,450
*10 x 12	10	4 x 14	1,500	1,650	1,800
*10 x 14	10	6 x 10	1,800	2,000	2,200
10 x 16	10	6 x 10	1,800	2,000	2,200
12 x 14	12	6 x 12	2,200	2,300	2,500
*12 x 15	12	6 x 12	2,250	2,300	2,500
*12 x 17	12	6 x 14	2,300	2,600	2,800
12 x 19	12	6 x 14	2,300	2,600	2,800
*14 x 18	14	6 x 16	2,800	3,000	3,200
*14 x 20	14	6 x 16	2,900	3,000	3,200
*14 x 22	14	8 x 16	3,000	3,200	3,400
*16 x 20	16	8 x 18	3,600	4,000	4,250
*16 x 24	16	8 x 18	3,700	4,000	4,250
*20 x 24	18	10 x 20	4,800	5,400	5,750
*20 x 26	20	10 x 24	6,000	7,000	7,450

The prolonged conflict in Brazil has at length been brought to a period. Official dispatches confirm the fact of the sinking of the insurgent battle ship "Aquidaban" by a federal torpedo boat in the harbor of Santa Catharena on April 16. Admiral Mello has given up the struggle, and, with five ships, has surrendered to and obtained asylum from the Argentine Government at Buenos Ayres. The revolutionary movement is said to have completely collapsed.

Philadelphia business men complain bitterly of the disadvantages suffered by their city from the discrimination practiced by the railroads in the matter of freight rates. Concerted action will be taken by them, it is said, with a view of improving and enlarging the transportation and shipping interests of Philadelphia, which have suffered severely of late.

The delay in the construction of the new dry dock at the Brooklyn Navy Yard is attracting the dissatisfied attention of the Government. It is very probable that the present contract with Mr. Gillis may be revoked, and the Government may either carry on the work itself or allow another private firm to complete the dock, which is urgently needed for the ships of the new navy.

A shipment of 2800 tons of bituminous coal was made last week from Baltimore to Montreal, Canada, although a duty of 60 cents a ton and freight charges bring the price of the fuel considerably over that of the Nova Scotia product. Some of the Canadian manufacturers are, however, dissatisfied with the domestic coal, and it is for these parties that the present shipment, the first of its kind, has been made.

The depression in business and the accompanying restriction of imports is clearly illustrated by a statement of Custom House receipts since the beginning of the fiscal year, published in the *Journal of Commerce*. These receipts are shown to have fallen off $41,224,363, or nearly 40 per cent. as compared with those of the corresponding portion of the last fiscal year.

Press Working of Sheet Metals.—V.

BY OBERLIN SMITH.

Bending Processes.

Following a natural order, we come next to forming or bending processes, where the metal has its surfaces pushed out of their original planes into some new shape, but where the thickness is supposed to be not materially altered, except where it is incidentally made thinner in certain spots by being stretched, &c. In Fig. 177 is shown a V-shaped pair of bending dies and beneath them a straight plate of metal, *a*, together with the same as it appears after bending, at *b*. The dotted line *b'* shows where the dies tried to bend it and the black line *b* its final position as assumed by its own elasticity. This, of course, varies with the material, a piece of lead or even copper remaining very nearly in the same shape as the die which forms it, while iron, mild steel, hard brass, &c., in the order named, require such a die to be of a more and more acute angle, as the metal approaches nearer the character of a spring.

In Fig. 178 is shown a pair of bending or forming dies which are removed one step further from the simplicity of the first named, giving two bends to the work instead of one. Here the same difficulty occurs in regard to the edges springing part way toward their original shape after leaving the die, as shown again by the lines *b b*. It is not therefore possible with a die of this kind to produce edges which are exactly square with the main body of the plate. An approximation may, however, be sometimes made by bulging upward the horizontal surfaces of the dies, as shown by the dotted lines in Fig. 178, to an extent not greater than is suited to the elastic limit of the particular pieces of metal used. The die therefore attempts to make the work somewhat concave upon the bottom, as at *c*, which forms the corners at a sufficiently acute angle to approximately counterbalance the tendency to spring open; so that when the bottom has sprung back flat the edges will stand up perhaps nearly enough at right angles thereto. To place practical dependence upon this system, however, requires uniform blows by the press and uniform elasticity in the metal.

Forming Processes.

In Fig. 179 is shown a pair of round forming dies, where a flat circular blank, *a*, is laid in the recess *m*, which acts as a gauge merely for locating it centrally. It is then pushed by the upper die, or punch, U through the parallel opening *n*, and falls beneath the dies—being stripped off the punch when the same is ascending by the sharp stripping edge *o*. At *b* is shown the shape of the work when in a half way stage of the operation, its final condition being as at *c*. With dies of this kind the edge of the work cannot be very deep in proportion to its diameter, on account of the wrinkles which evidently attempt to form when the circumference is reduced. It is true that these incipient wrinkles can be somewhat smoothed out by allowing the punch and die to fit tightly enough to confine the metal to its original thickness—providing this thickness came uniform, which it usually does not in practice. In doing this, however, the metal of the edge is lengthened in certain spots in a vertical direction, which causes a jagged edge. If the depth is too much increased the wrinkles so fold upon one another as to tear the metal entirely away at certain places. The remedy for this will be considered later on under the head of the drawing process. With metal like ordinary tin plate, in diameters of not less than 2 inches, a width of edge from $\frac{1}{8}$ to $\frac{1}{4}$ inch can usually be obtained in plain forming dies without objectionable wrinkles.

With cylindrical work like that in question, and also with elliptical work (which resembles it by having a convex contour with an edge extending all around) the outward springing of this edge does not occur to an objectionable degree, as it does with rectangular work having two separate and unconnected edges, like that shown in Fig. 178. This is because the edge C forms itself into a hoop, as it were, to confine itself from moving outwardly, which it cannot do when released from the die without actually stretching in a circumferential direction; and this evidently can occur but in a very slight degree.

In Fig. 180 is shown a pair of forming dies for turning an edge upon an internal instead of an external circular contour. These take a perforated blank, *a*, and open out the hole, turning it downward into a cylindrical shaped edge, as at *b*. If an attempt is made to get this edge too wide certain cracks will appear, as at *c c*, &c., in the picture. As the edge in opening outwardly increases its circumference, it will not stand more than a certain amount of tensile strain, the stress here being of exactly an opposite character to the compressive one which forms the wrinkles in work like that in Fig. 179.

Embossing.

In Fig. 181 is shown one type of a pair of embossing dies, so called. The word "embossing" is used in this treatise, and very generally in the sheet metal trades, to denote a small degree of forming or bending at various points upon the surface of a piece of sheet metal, the location of which usually tends to show in top view a figure or design of some kind, decorative or otherwise, as for instance pictures, symbols, lettered inscriptions, &c. In such work the metal is pushed downward or upward more or less at various points into ridges and grooves, but not to a sufficient extent to tear it apart. The tendency is evidently to so tear it, as its outer edges are maintaining a rigid resistance against inward flow (except in certain forms of the drawing process) and the metal has therefore to elongate where forced to take a shape whose cross section shows a longer profile line. This is shown by the section of the piece of embossed work, *b*, which is longer in profile than is the blank from which it was made, *a*. In the case given I have represented a pair of circular dies with two annular grooves sunk in L, corresponding ridges projecting from U. This is a design sometimes used upon the heads of tin cans, &c., its object being partly to make them stiffer and perhaps partly for ornament. Such embossing, however, is merely typical of an infinite number of designs which may be thus stamped upon ductile metal. The word "embossing," as applied to this process, should not be confounded with the same term as sometimes used to designate the process known more properly as coining, to be described further on.

In Fig. 182 is shown a broken away vertical section of one groove and ridge of a pair of embossing dies, where the flat surfaces have approached each other within a distance measured by the thickness of the metal, represented by *m*. Theoretically the space between upper and lower die might properly be this thickness, *m*, at the points *n*, *o* and *p*, as the metal would then exactly fill between at all points. Practically, however, it is better to give an embossing die clearance at such points as *n* and *o*, letting the metal follow the "tight points" to suit itself, as in the picture. This is desirable, because some of the metal may be a little too thick, or dirt may accumulate in the dies, in either of which cases there would be a jam between the points *n* and *o*, which would prevent the dies coming down home, or, at any rate, would require a great deal more pressure to do the work. Another reason for this clearance is the practical difficulty of the die maker being perfectly sure that there is space enough everywhere, unless he follows the method here given, of being sure there is enough by having too much. It is customary to give a little clearance at *p* also, but this is not of so much importance, as a jam at that point would simply prevent the flat surfaces from coming together quite so close.

A simple method devised by the writer and long practiced by those working under his instructions for ascertaining the clearance of forming and embossing dies is to lay pieces of small lead wire, whose diameter may be about two times *m*, across the dies at the various points requiring a test. Between these points small pieces of the sheet metal to be used, whose thickness is *m*, are laid upon the lower die to act as blocking, so that the proper stopping point of the upper die may be insured. The press ram is then brought hard down, with the result of the lead being smashed out to the varying thicknesses represented by the spacing of the dies and as shown in Fig. 183. It is evident that all such points as *n* and *o* ought to be thicker than *m*, and this is generally easily determined by the eye. Such points as *p* must, of course, never be less than *m*, and may be a little more.

Embossing and Cutting.

Almost all the various processes of forming and embossing may be combined with cutting wherever the work is of suitable shape. The tools for conducting such operations are usually termed "combination dies," although the term is not very definite, being sometimes used, as before described, for the combining of two or more sets of cutting edges. In Fig. 184 is shown in vertical axial section a pair of combination dies such as are very extensively used for producing fruit can tops, as shown in section at *a*, and bottoms, as shown with embossed groove *a'* or plain at *a''*. In practice these dies are assembled in separate pieces to some extent to insure cheapness, durability and facility of repairs, but they are here depicted in conventional form. It will be seen that the outer cutting die has the female at the bottom as well as the inner one, a result which was not obtained in Fig. 166, Chapter IV., where the work remained flat. In this case the latter part of the upper die's descent cuts the central hole, while the forming of the edge at *b* and the embossing of the groove at *c* is taking place. It will be noticed that the turning upward of the inner wall of this groove causes a

Correction.—In the chapter of this article on page 40 of *The Metal Worker* of April 14, column one, twentieth line from the bottom, the letters "S" and "C" should be transposed, "S" properly being the sprue and "C" the casting.

tendency to crack, as in *b*, Fig. 180, although in practice it is not made deep enough to produce this effect. Such action does not take place in *a'*, because the stretching action is resisted by the continuous surface in the center, which is retained in the case of this can bottom by removing the central cutting punch *d* from the upper die. Should a plain flat bottom be desired, as at *a''*, the embossing punch *e* is also removed.

A knockout ring is shown in upper die at K and in lower die at K'. They are unnaturally given in closed position (as they would be were the dies shut together) merely to show better the general contour of the sectional view. Sometimes what is called an "edge knockout" is used, instead of K', consisting of a thin ring rising in the groove K'' and pushing against the edge of the work, instead of underneath its flat surface. This ring K'', if driven up by strong springs, acts in some degree as a spring drawing attachment (to be described later on) and serves to smooth out the slight wrinkles which usually otherwise appear in the edge of the work. The knockouts described are generally driven by springs, but sometimes by pins extending through the dies and attached to or pushed by certain positive action knockout devices.

The speed at which forming and embossing work is done is of little consequence, as in practice the ram speeds of the presses in common use are none of them fast enough to tear the metal by moving it more rapidly than its molecular inertia will permit. The pressure required for the processes above described varies considerably, according to the character of the work and the condition of the dies. For given pieces of metal, however, it frequently happens to be a good deal more than for the cutting operations performed upon the same.

Assembling.

Analogous with forming processes proper, there are various cases where the assembling of two or more pieces is done, oftentimes upon the same general principle as the riveting down of an eyelet, or a rivet, which has been passed through two pieces of paper or metal. In general, some piece of metal which has previously been brought to shape by dies or otherwise is driven tightly, or perhaps dropped loosely, into or on to some other piece or pieces, whereupon they are all fastened together by some auxiliary forming process which bends or forms certain edges or surfaces in a manner best adapted to locking the various pieces permanently together.

Involuntary Processes.

In addition to the humanly invented processes we have been considering, there are sometimes developed others, which, to a careless observer, might seem to emanate from the brain and hand of his Satanic Majesty. Among what may thus be called involuntary processes is the very annoying one known as warping, which occurs especially in the products of embossing and forming dies, as well as to some extent in drawn work also. The most favorable conditions for its occurrence are thin metals, large diameters, and edges so shallow as not to form stiff trusses in themselves. The die maker is often blamed for work thus coming from the press twisted and sprung, so that it is impossible to make it lie flat upon a plane surface. Generally, however, a result of this kind is entirely owing to its design; and Dame Nature, rather than the die maker, must be blamed for one of the most provoking and perplexing problems which the die user is called upon to solve.

Mechanically the cause of this warping is due to the middle of the stamped sheet of metal being too small for the outside thereof, so to speak. This occurs when the central parts have been embossed or otherwise drawn together and put under a tensile strain, while the average circumference of an outer zone, near the edges, has not been correspondingly reduced, and therefore does not assume the shortest distance around its course, which would naturally lie in a plane. A remedy is sometimes found by altering the design so that this outer zone may have various ribs and corrugations running approximately in a radial direction toward the center, such corrugations tending to take up the surplus metal in a circumferential direction. These additional features can often be added by a judicious designer in a way to serve a decorative purpose. A similar warped effect can obviously be produced by letting the middle of the metal alone and stretching or otherwise increasing too much the area of the edges. This, alas, is often done by forming dies when turning a narrow vertical edge around a large thin blank. Such action is due to imperfect "upsetting,"

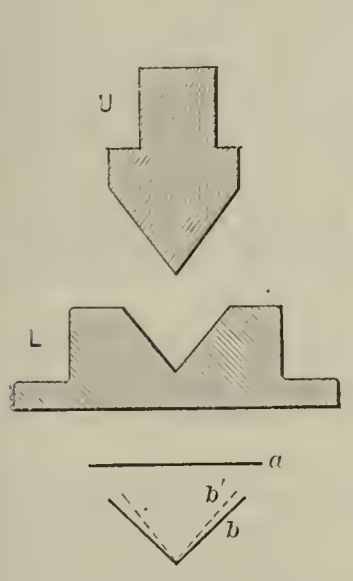


Fig. 177.

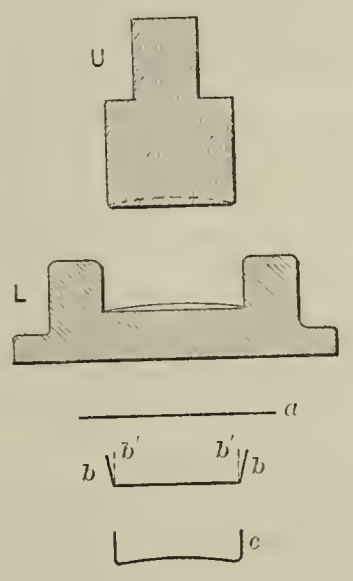


Fig 178.

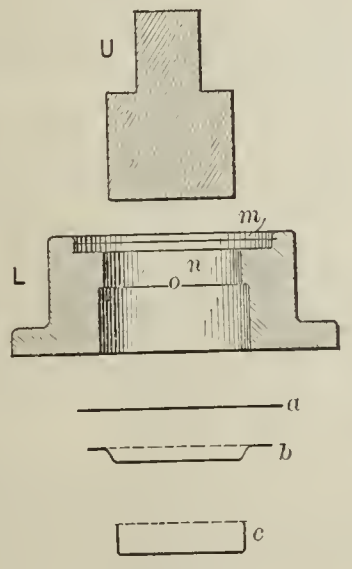


Fig. 179.

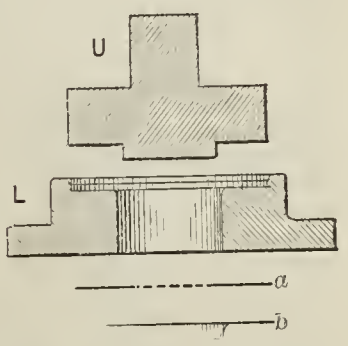


Fig. 180.

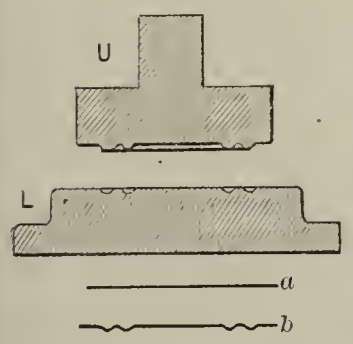


Fig. 181.

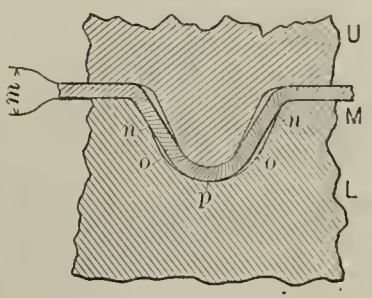


Fig. 182.

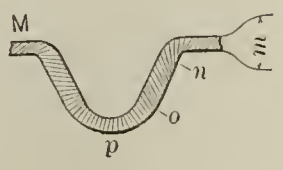


Fig. 183.

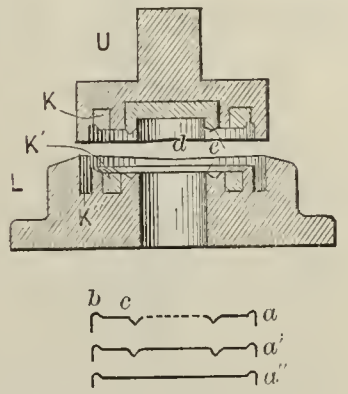


Fig. 184.

where the circumference is reduced, and perhaps also to a too tight squeezing of the edge between the dies.

The converse of the conditions above mentioned occurs when the middle part of the sheet is too big for the outside, as is the case in any dished or saucer shaped work. This is often seen in bottom of buckets, &c., which have been somewhat bulged and which can be "flopped" back and forth, always staying in a position at either side of the plane of the outer zone of the metal accordingly as they are put. In such case the said outer zone is pushed outwardly by the central parts and is therefore in a taut condition, which tends to make it stay flat rather than otherwise. If that surpassingly skillful artisan known as the "saw maker" were to tackle a sheet of this kind, he would soon flatten it by hammering it near the edges. If, on the contrary, he hammered it in the middle, it would be because the conditions described in the last paragraph were present.

For the various forming and embossing processes described in this chapter, almost any type of press may or may not be suitable, according to circumstances. The type least likely to meet all conditions is, perhaps, a drop press, which usually has the peculiarity of a faster moving and more loosely fitting ram than have other presses. These machines, however, are especially adapted to some kinds of embossing work, and are sometimes used for forming, particularly in producing shallow pans, plates, trays, &c., in tin plate and sheet iron. In recent years they have been, for these latter functions, superseded to a considerable extent by drawing presses.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

AMONG recent contracts obtained by H. Sandmeyer & Co., Peoria, Ill., was one for ventilating the Streator (Ill.) school, a ten-room building that cost $35,000. Other contracts are for the Dickson dry closets in schools at Highland, Ill.; Effingham, Ill.; Tuscola, Ill.; Pana, Ill.; Lafayette, Ind., and Gilman, Ill. The ventilated flushing closet, which is also meeting with much favor, is contracted to be put into the Marshalltown (Iowa) High School and in the Streator (Ill.) school.

COE & MCMILLEN, Monticello, Ill., have secured a contract for heating and ventilating the school building at Monticello for $1872.72. They will use a 54-inch by 14-foot tubular boiler, made by the Kewanee Boiler Company of Kewanee, Ill., and Perfection radiators for the direct and Excelsior stacks for the indirect, it being a system of natural ventilation. The work will be done by C. W. DeForrest, formerly of E. K. Lockwood & Co. of Norwalk, Conn.

CARSON & CO., Danville, Ill., have the contract for plumbing in the school building at Monticello, Ill., which will consist of a No. 2 Wolff range closet and urinal and a drinking fountain on each floor. The bid for the work was $561.

THE J. H. MCLAIN COMPANY, Canton, Ohio, have secured an order through their San Francisco office for two Humber hot water heaters for the Whittier School, a State institution at Los Angeles, Cal.

T. B. DEWEES, Phœnixville, Pa., has received the contract for roofing and plumbing for two new houses on Church street. He also has the contract for roofing two new houses at Spring City.

PLANS are being prepared for the erection of an $8000 armory at Detroit, Mich., to be lighted by gas, heated by steam and to have a plumbing system.

F. J. WOOD is to erect a store and office building at a cost of $20,000 at Grand Rapids, Wis., to be heated by hot water and have a plumbing system.

THE SCHOOL BOARD of Meredith, N. H., have appropriated $700 for a steam heating system for the school house.

JOHN SIMMONS COMPANY, 110 Centre street, New York, are furnishing to Edward P. Clarke, 126 Liberty street, New York, a hot water boiler and the heating pipes and radiators, to be exported to La Guayra, South America.

THE COUNCIL of Providence, R. I., have appropriated $3500 for a heating system for the new central police station.

AN IMPROVED HEATING SYSTEM will be installed in the Winona Seminary, recently purchased by the Sisters of St. Francis of Winona, Minn.

THE DAVIS COMPANY of Moline, Ill., have been awarded a contract for plumbing the new High School Building, their bid being $1300.

FAY & SCOTT of Dexter, Maine, have the contract for installing a steam heating plant in Union Hall at Pittsfield, Maine.

J. GLANDFIELD & SON of Dixon, Ill., have the contract for the erection of a school house to cost $19,000, at Oregon, Ill., which will have a system of heating and ventilating not included in their bid.

WRIGHT BROTHERS of Ipswich, Mass., are installing a hot water heating plant in the residence of E. A. Wright, at Hamilton, Mass.

THE BOARD who have in charge the erection of a home for the feeble minded at Lapeer, Mich., have awarded the contract for heating to the Eureka Heating Company of Saginaw, Mich., for $7140, and the contract for the plumbing to William McFadden of Detroit for $2497. The contract for sewerage went to Perry & Hurley.

T. J. TUOMEY, Seventy-second street and Third avenue, New York, is doing the plumbing work in the office building being erected by J. Lyons at Fourth street and Broadway. He is also remodeling the plumbing system in the old *Herald* building, at 194 Broadway, and is fitting up a storage warehouse for Sonn Bros. at 385 and 387 Washington street.

THE HUB PLUMBING, HEATING & STOVE COMPANY, Clinton, Mass., are putting in a system of water works in the town of Boylston, Mass.

THE CONTRACT for supplying the heating apparatus for the Young Men's Christian Association building at Springfield, Mass., was awarded to the Phillips Mfg. Company of that city, whose bid was $3300. They will use two No. 4½ Mills boilers of 37 horse-power each.

THE J. F. PEASE FURNACE COMPANY of Syracuse, N. Y., have recently secured through their agent at Harrisburg, Pa., E. E. Palmer, the contract for warming and ventilating the six-room annex to the Maclay Street School at that place.

ARCHITECT G. L. HARVEY, Chicago, is making plans for an apartment building for Dwight S. Bryant, to be built on Forty-seventh street and Prairie avenue. The apartments will have all modern improvements, exposed plumbing and hot water heat.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to install a tubular boiler and necessary radiation for steam heating in the new Post Office block, Fifty-fifth street and Monroe avenue.

THE UNION IRON WORKS & STEAM HEATING COMPANY, Altoona, Iowa, have the contract for placing a Gurney double crown heater in the residence of T. D. Foster.

A LOW PRESSURE SYSTEM of steam heating will be placed in St. Mary's School, Burlington, Wis., by A. Zweibe & Son. One of the United States Heater Company's Hecla boilers will be used.

MCGINNIS, SMITH & CO., Pittsburgh, Pa., recently installed the hot water heating plant in the Black & Bayard office building, at Pittsburgh, Pa. They used two No. 25 Gorton hot water boilers connected with one flow main and report satisfactory operation and a good circulation with a low temperature at the boiler.

DUGAN BROTHERS, Salem, Ore., are installing a Royal hot water heater in the Oregon Soldiers' Home at Rosebury. The same firm have also the contract for doing the plumbing.

BIDS will be received up to May 2 for the plumbing, gas fitting, steam heating and ventilating apparatus for the city and county hospital at St. Paul, Minn.

ARCHITECTS THOMAS & RAPP, Chicago, have received instructions from the Board of Education of South Evanston, Ill., to rebuild the school house recently destroyed by fire. The building is to be heated with steam and furnished with the latest improvements in ventilation. It will cost about $40,000.

ARCHITECTS BEERS, CLAY & DUTTON, Chicago, have designed for John R. Geary a four-story apartment house to be built on the east side of Okenwald avenue, south of Forty-fourth street. The interior will be divided into eight apartments of seven rooms each and be heated by steam.

ARCHITECT ALFRED SMITH, Chicago, has prepared plans for a residence to be erected at 375 Ashland avenue. The front will be built of stone and the interior finished in hardwood and heated by hot water.

ARCHITECTS FLANDERS & ZIMMERMAN, Chicago, have prepared plans for a store and apartment house to be erected at the southwest corner of Fifty-fifth street and Monroe avenue, to be heated by steam.

ARCHITECTS J. SIDNEY VILLERE & Co., Chicago, are preparing plans for a three-story apartment house to be built at the northwest corner of Deming and Hampton Courts, by J. Frank, to be heated by steam.

THE BRIDGEPORT STEAM HEATING COMPANY, Bridgeport, Conn., have secured the contract for placing the hot water apparatus in the new mansion of Elwood Stokes Hand at Southport, Conn.

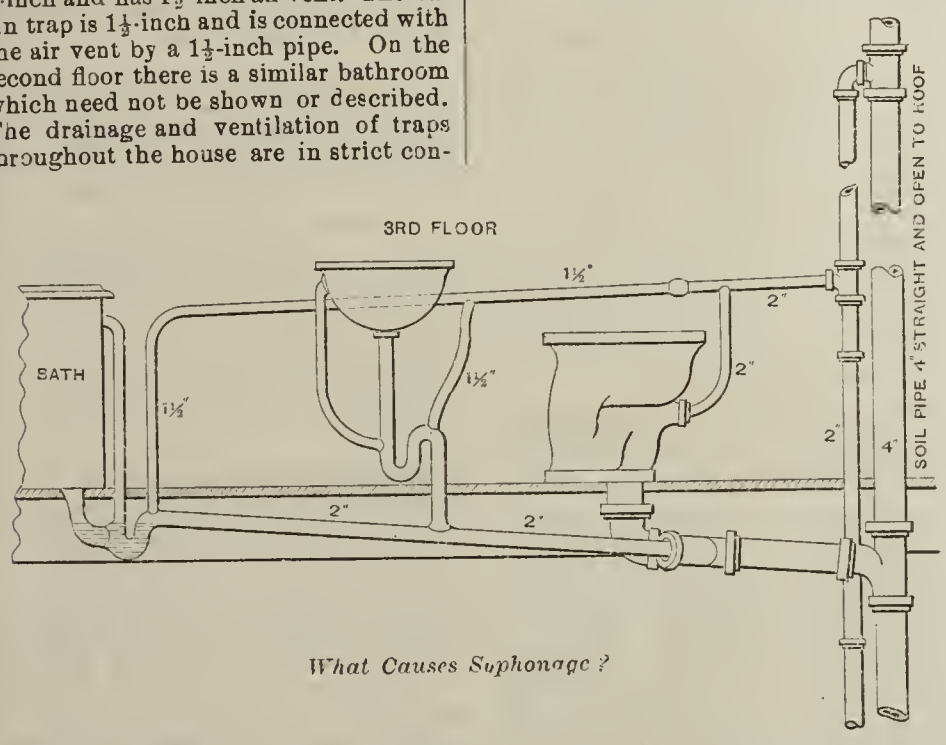
ARCHITECT DEWITT TAYLOR KENNARD, Chicago, has designed for H. C. Brachvogel a three-story apartment house to be erected on Vincennes avenue, near Forty-eighth street, to be heated by steam.

THE CONTRACT for the steam heating and plumbing in the Planters' House, at Pekin, Ill., which is to be transformed into a modern office building, was awarded McGreggor & Co. of Bloomington, for $800.

PLUMBING and GAS FITTING.

What Causes Syphonage?

From INQUIRER, *New York.*—Herewith is a sketch of the plumbing of a three-story house showing the pipes for drainage and ventilation. The water closet is of the ordinary washout kind, having a 2-inch air vent of lead pipe connected with a 2-inch iron pipe. The waste pipe of the bathtub is 2-inch and runs into a 4 x 2 Y that connects with the main soil pipe. The bath trap is 2-inch and has 1½ inch air vent. The basin trap is 1½-inch and is connected with the air vent by a 1½-inch pipe. On the second floor there is a similar bathroom which need not be shown or described. The drainage and ventilation of traps throughout the house are in strict conformity with the Board of Health rules. The job has been done in a workmanlike manner, no contractions of areas in any of the pipes or connections. All of the system is perfectly free from stoppage or solid joints or forgotten oakum. Will some of the thoughtful readers of *The Metal Worker* explain why the traps of the baths and basins are syphoned by the use of the water closet either from a prolonged flush or ordinary use?



What Causes Syphonage?

Plumbing Trade in Brooklyn.

Brooklyn plumbers generally report themselves as being fairly busy. The jobs in hand are, however, almost exclusively of small proportions. Householders are this season only having just such work done as they find to be absolutely necessary, and there is said to be a marked absence of the "cream" orders which usually develop in the early spring. The business depression of the past nine months seems to have touched all classes more or less, and this is reflected in the plumbers' order books as well as in those of the supply houses. In illustration of the situation, one of the most prominent plumbers of the city, who is accustomed at this season to handling contracts for work amounting individually to thousands of dollars, says that he looks on a $150 or $200 job at the present moment as quite a large one. Even these are comparatively scarce. In the spring he usually has orders for from eight to a dozen porcelain bathtubs, but this year there has not been a call for a single one. Collections, moreover, are not easy, and a good deal of even the smaller work is being taken on the installment plan of payment. The amount of building now in hand in Brooklyn is comparatively insignificant. Nevertheless, the hope that "springs eternal" prompts to the expectation of a development of better things in the summer, with a very good fall business, "provided the tariff bill is meanwhile passed or smashed," for there is plenty of work waiting for the time when money shall again flow in its accustomed channels.

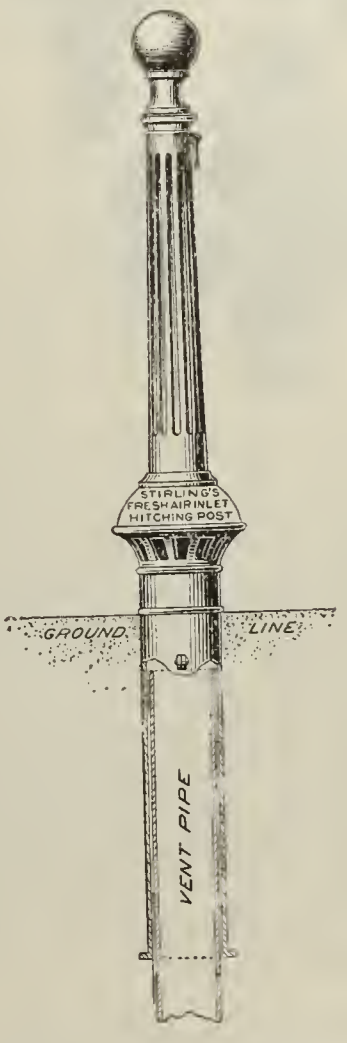
Newark, N. J., Plumbers.

The regular meeting of the Master Plumbers' Association of Newark, N. J., last Tuesday evening, found an attendance of 50 members and a very interesting meeting was the result. The committee who had waited upon the plumbers who had made an extraordinarily low bid to the city for plumbing and steam heating repairs for the coming year, reported that the bids had been withdrawn and the association expressed their gratification at the good work accomplished. Another feature of the evening was the appointment of a committee of five to make arrangements to celebrate the first anniversary of the association, which occurs on June 27. President Berla was very deliberate in selecting the members for this committee, and a number of pleasantries were exchanged during his deliberations. Treasurer Jacobi was selected for chairman.

ON A RECENT VISIT to the Department of Building of New York City it was discovered that in the plumbing and ventilating department the corps of engineers were more than two days behind in considering the plans that had been submitted to them for approval, and that these plans included a number of large and high class buildings. While this information comes from the Department of Plumbing and Ventilation, it shows that other lines of trade will be equally busy in the construction of the buildings and of the various appliances that will be needed in them. Until latcly comparatively little was doing in this department, and Henri D. Dickinson looks on the rush of work at the present time as of more than ordinary importance in all lincs of trade.

Fresh Air Inlet and Hitching Post.

The accompanying illustration shows a novel combination of fresh air inlet and hitching post made by Edward M. Stirling, 85 Market street, Newark, N. J. The construction and application



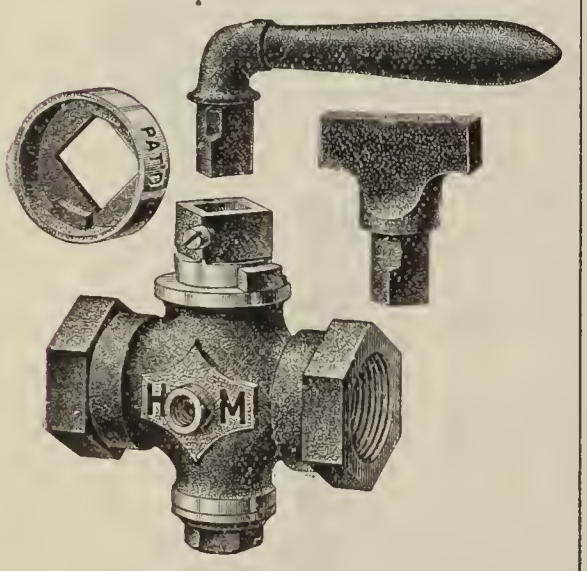
Fresh Air Inlet and Hitching Post.

of this device are so clearly indicated in the engraving that very little description is needed. It consists, as shown, of an ordinary hitching post, with perforations near the bottom connecting with the inner pipe that forms the lower end of the post, and fits over the top of the fresh air inlet from the house drain at the foot of the soil and waste pipe system on the house side of the trap. It is particularly mentioned by the manufacturer that this inlet is not liable to be clogged by dirt and become

useless, and does not present a conspicuous hole to be filled up by the mischievous small boy.

The Mueller Stop and Waste Cock.

The H. Mueller Mfg. Company of Decatur, Ill., have just put on the market a new stop and waste cock which has some special features which will be appreciated by plumbers. An illustration of the device is herewith given. It is so constructed that it can be changed instantly from right hand to left hand, or *vice versa*. The top is interchangeable, permitting the use of either lever handle, tee handle or square rod. The top of the cock is supplied with a cap that fits over the square of the plug, thereby preventing dirt or sand from working down alongside the plug and wearing out the cock. The cap is provided with two heavy lugs cast on the under side, and these coming in contact with a heavy lug cast on the body of the cock form a very strong and substantial check. These cocks are made only in straight way from ½ inch



The Mueller Stop and Waste Cock.

to 1 inch inclusive. They are designed for indoor work, but can be used for outdoor work equally well. The company state that these cocks are of a specially high grade of workmanship. The company also make a complete line of standard patterns of cocks for outdoor work, both in straight way and round way. All their brass goods are made of red brass metal and extra heavy pattern, and are tested to a pressure of 200 pounds. These goods are branded "H. M." A special claim for the cock herewith illustrated is that the plumber need not carry such a large stock, because he can use this make of cock for either right or left hand, lever handle, tee handle or square rod.

TRAPS AND VENTS.

The Brooklyn master plumbers will, it is expected, send a full and representative delegation to the forthcoming national convention at Detroit.

R. M. Wilson, Rome, N. Y., issues a catalogue of his well-known line of plumbers' supplies. In presenting the catalogue for 1894 the manufacturer calls special attention to his complete line of bathtubs. The Wilson patented aluminum and all copper sanitary bathtubs are especially alluded to. They are made from pure aluminum and Lake Superior copper, and have no enamel or paint. Other goods particularly noted are his folding copper lined bathtubs, copper range boilers, &c. The volume, which contains over 100 pages, begins with notices of bathtubs, followed by range boilers, copper balls, shower baths, bath and basin cocks, traps, lavatory brackets, miscellaneous fittings, ferrules, brass fittings, valves, pulls, flush tanks and closet seats. At the close is an alphabetical index.

Zalmon Goodsell of Bridgeport, Conn., one of Connecticut's representative plumbers, is being boomed by the local papers for Governor of the State. Those who have met him at the State and national conventions of master plumbers can testify of his fitness for the office.

J. E. Zimmerman, representing the Ideal Mfg. Company of Detroit, Mich., manufacturers of the Ideal sinks and tanks, recently shed the light of his presence upon the Boston trade.

The popularity of the smoke test for finding leaks in plumbing systems is shown by the number of plumbers who are securing apparatus for the purpose, among whom are L. D. Hosford, 43 Beekman street, E. A. Moody. 939 Sixth avenue, T. J. Daly. 1688 Broadway, and Ryan & Holmes, 280 Boulevard, New York, and George B. Lewis of Brooklyn. The machines used are of English manufacture and were purchased from the importers, the Myers-Sniffen Company, Limited, 46-48 Cliff street, New York.

W. P. Rose & Brother have opened a plumbing shop at 3620 Jacob street, Wheeling, W. Va.

The master plumbers of Holyoke, Mass., met at C. P. Lyman's office last Saturday night and talked over matters connected with the convention of the State association of master plumbers to be held in the city May 9. The meeting will be held at the Hamilton and will end with a supper at the hotel in the evening. About 75 members of the association are expected from out of town and all the local members will attend. The most important business will be the election of officers and there will be reports of committees appointed at the last meeting to secure legislation on certain points connected with the business. Discussion will be held on the plumbing ordinances adopted in several cities.

Fred. C. Barrett has moved his plumbing establishment to 24 Taylor avenue, Westfield, Mass.

The Board of Plumbing Examiners of Holyoke, Mass., are Dr. G. H. Smith, Peter Murray and Dennis O'Leary. They are now prepared to examine all who apply for licenses, and hope to have all applications in by May 1, after which date Inspector Murray will enforce the recently passed plumbing ordinances.

The R. T. Connell Plumbing & Heating Company have been incorporated, with a capital of $20,000, at St. Joseph, Mo. The incorporators are R. T., D. C. and Margaret Connell.

Wright Brothers are a new plumbing firm in the Jones Block, at Ipswich, Mass. They will carry a full line of steam and hot water heaters, stoves, furnaces and ranges.

Milton Schnaier of the plumbing firm of Boyd & Schnaier, 347 Columbus avenue, New York, has been appointed one of the advisory board of the Baron de Hirsch Trade School. He will recommend a new system of instruction for the plumbing class that presents some excellent features. The course will require six months, and a month will be devoted to each of as many different branches of the trade, accompanied by special lectures. By this means the pupils of the school will all have received the same instruction at the end of the term, and like regular journeymen will have an opportunity to discover for which branch of the trade they are best qualified.

Norwood & Bayle is the name of the new firm in the plumbing, hot water and steam heating business at Pittsfield, Maine.

W. A. Putnam has purchased the tin and plumbing business of John R. Todd at Warren, Mass.

Spring & Prasse, Keokuk, Iowa, have opened up a plumbing, steam and hot water heating, tin and sheet iron shop at 418 Main street.

D. B. Sullivan, plumber and tinsmith, has leased the store, 57 Little Water and 49 Shetucket streets, Lucas Block, Norwich, Conn. He will move into his new quarters about May 1.

Campbell & Dunn will succeed the late firm of Carey & Campbell, plumbers, at Erie, Pa., the dissolution of which was brought about by the death of Mr. Carey.

Celete D. Lindsey has opened a plumbing shop at 16 Moore street, Bristol, Va.

John Tucker is sending out an attractively arranged circular, printed in brown ink, bearing the addresses 130 and 132 Bellevue avenue, Newport, R. I., and 253 Fourth avenue, New York. It is a notice of his recently opened branch establishment at the former address. Plumbing, gas fitting and hot water heating are solicited, and it is stated that a specialty will be made of yacht plumbing and fitting up Turkish, Russian, shower and needle baths. A list is given of prominent citizens for whom he has done work, as well as of architects and builders.

T. J. Tuomey, Seventy-second street and Third avenue, New York, is using one of the smoke testing machines made by the Bailey-Farrell Mfg. Company for testing plumbing systems. The smoke test possesses several advantages and he is well satisfied with his experience with it.

One of the latest attractions in the show windows of the plumbing establishment of T. Sullivan, 34 East Twentieth street, New York, is a gas engine such as is used by him in raising water to tanks of high buildings in which he erects the plumbing fixtures.

Roberts & Simmons is the name of a new plumbing firm on La Salle street, Aurora, Ill.

Hammon & Leddy have opened a plumbing, gas fitting and tin shop in the rear of 230 Main street, New Britain, Conn.

The Myers-Sniffen Company, Limited, 46-48 Cliff street, New York, are sending out a four-page circular devoted to the recently patented improvements of the Em Ess Doherty self-closing faucets. These faucets have been on the market for the past 17 years and have proven their quality. The new feature is in the shape of the lever which opens and closes the faucet. They are

now made in such a form as to prevent them from slipping quickly from the hand and the resulting shock from destroying the valve seat. The cuts show the different faucets that are found in plumbing systems and the text states that they are furnished in polished brass, nickel plated and silver plated.

J. H. DONNELLY will move his plumbing and stove business into a new store on Main street, Springfield, Mass., May 1.

THE E. STEBBINS MFG. COMPANY, Springfield, Mass., have added a fine line of plumbers' specialties to the exhibit in the Board of Trade rooms.

A BILL before the Massachusetts Legislature decides the question of what constitutes a practical plumber, so far as applying to the inspectors of plumbing throughout the State. It requires the Plumbing Inspector to have worked five years at the business.

PLUMBER J. H. DONNELLY, Ware, Mass., will move May 1 into a new store in the Hampshire Block that has been remodeled and arranged to suit him. He will display an entirely new stock of goods.

THE MASTER PLUMBERS' ASSOCIATION of Rhode Island held its annual convention last Tuesday afternoon in Foresters' Hall, Newport, about 60 members being present. Ald. James Openshaw, president of both the Newport and the State associations, presided, and National President D. G. Finnerty, Vice-President Tierney of Providence and Vice-President Deady of Worcester, Mass., were present as guests. The visitors were shown about the city by the local members of the body, and were entertained at a bauquet, Joseph Haire and P. J. Murphy acting as toastmasters.

THE JOHN DOUGLAS COMPANY, Cincinnati, manufacturers of the Douglas tank, plumbers' wood work and sanitary closets, have opened a Chicago office in the Ogden Building, 34 Clark street, Room 511, with Geo. L. Bottum as manager. Samples of all goods manufactured by the company will be placed on exhibition. The warehouse at 80 to 82 Pratt street will be retained, and in it will be carried a full stock of goods. Mr. Bottum will also retain his connection with the Lausten Lead Works.

P. J. MURPHY, the plumber, has fitted up a most handsome sample room at his establishment on Spring and Mill streets, Newport. R. I. A Mexican onyx wash stand is among the samples.

A PRESS DISPATCH from Milwaukee, Wis., dated the 24th inst., states that the master plumbers and their men have reached an agreement and the danger of a strike is over, notwithstanding that the scale of wages is to be greatly changed. The new scale will go into effect on May 1. Heretofore there has been a sort of sliding scale, running all the way from $1, paid to boys, to $3.50, paid to skilled men. Now the men are divided into two classes and two rates are made, $2 for inferior men and $3 for superior men. That is, those are the standard wages for the grade. No inferior men will receive more than $2 per day and no superior men less than $3.

NEW ORLEANS, LA., is to have a new system of sewers, on which the work has just been commenced.

Chicago Plumbers' Strike Ended.

We are in receipt of a dispatch from Chicago to the effect that the plumbers' strike has been settled through the efforts of the Arbitration Committee of the Master Plumbers' Association and the Journeymen's Association. The two organizations have made mutual concessions, but the most important feature of the settlement is that the journeymen are to receive the old scale of wages—namely, $3.75 per day of eight hours.

The Ette & Henger Mfg. Company,

St. Louis, Mo., have just issued their catalogue No. 5, devoted to plumbing and water works. The catalogue contains 175 pages and includes everything which this firm make under the title head of the catalogue. Especial attention is drawn to the following lines, which are said to be entirely new to the trade: Their National service boxes are referred to as meeting with considerable success. In this style box the rods are placed inside the box, the combination key is adapted for opening the covers and also to fit on the end of stationary rod, the same key serving both purposes. Their line of gate valves is particularly complete, and it is claimed by the manufacturers that they are unsurpassed for quality of material, workmanship and principle. Each valve is tested to 300 pounds pressure. The National compression stable hydrant on page 31 combines a hitching post and drinking fountain, and is guaranteed anti-freezing. The merits of their Non-wasting hydrant are especially referred to. They call particular attention to their line of hose pipes, as shown on page 68. There are no joints, no packing, &c., in these pipes to leak or wear out, and they will throw a full stream or any spray desired. The spray adjustment will permit of a spray as fine as mist, and will close off pressure entirely, acting as a cock. Their pneumatic water works is a newly perfected and simple system for supplying water by means of compressed air to houses, hotels, schools, public buildings, stock farms, &c. Their line of combination bathtubs occupies ten pages in the catalogue and are referred to as portable self heating, and in addition will give singly or in combination any of the following baths—hot water, cold water, hot air, steam, dry or wet vapor, dry or wet electric foot baths, alternating hot or cold showers, alternating hot or cold and plain, perfumed, or medicated spray, douche, syringe or bidet baths, and in addition have an adjustable stool with comfortable lazy back, which by a simple arrangement will automatically rub the back, with either brush, sponge, towel, or electrode. In addition to the lines of goods above enumerated they show many other plumbing and water works devices, which will be appreciated by the trade. The catalogue is being sent to the trade, and those interested are requested to send for a copy, which will prove a valuable addition to trade literature in this line.

The Cataract Electric Company of Buffalo, N. Y., have closed a contract with the Niagara Falls Power Company, whereby power will be supplied for use in Buffalo about October 1.

FLASHINGS.

THE GLOBE VENTILATOR COMPANY, Troy, N. Y., are distributing to the trade an illustrated catalogue and price-list in the interest of their well-known Globe ventilators and chimney caps. The pamphlet is tastefully published and many illustrations show the cap itself and its application to buildings. These goods are made in brass, copper and galvanized iron and are recommended for the ventilation of schools, churches, hospitals, theaters, halls, mills, factories, cars, stables and farm buildings of every character. They are also referred to as a cure of smoky and sluggish chimneys and a corrector of downward drafts. They are likewise useful in removing sewer gas and are employed for rendering attics comfortable. A description of the ventilators is given and many testimonial letters are presented from those who have used them.

THE DECATUR STEEL ROOFING & CORRUGATING COMPANY of Decatur, Ill., are distributing interesting pamphlets descriptive of their specialties. One of these is an illustrated treatise on "Laying Steel Roofing," by L. S. Bonbrake, and the other shows the style of goods manufactured by the company, such as rock face brick siding, sheet steel pressed brick, beaded iron, crimped roofing, corrugated iron, steel clapboards, metal corner boards, crimped edge roofing, eave troughs, conductor pipe, elbows, &c.

CASEY & GALLIGAN are a new firm in the tinning, roofing and plumbing business on Iron street, Bloomingburg, Pa. Mr. Galligan was formerly employed by John Bird and J. S. Thorn of Philadelphia.

WORK is being rapidly pushed on the tin mills at the Ætna Standard plant, Bridgeport, Ohio. The machinery has commenced to arrive and it is expected that operations will be commenced in from 60 to 90 days. The first mills built will be experimental, and if the venture proves successful several more will follow. The old puddling department of the Standard plant has been entirely cleared and the building will be used as a tinning house. This arrangement concentrates the tin plate operations, as the tin mills are being erected where the Ætna plate mill formerly stood, directly opposite the Standard puddling department. Many other improvements are going on at this already extensive plant, and an increase in the capacity of the galvanizing shop is under consideration. During the past few weeks the Ætna-Standard mills have been operated more steadily than at any time since work was resumed last fall.

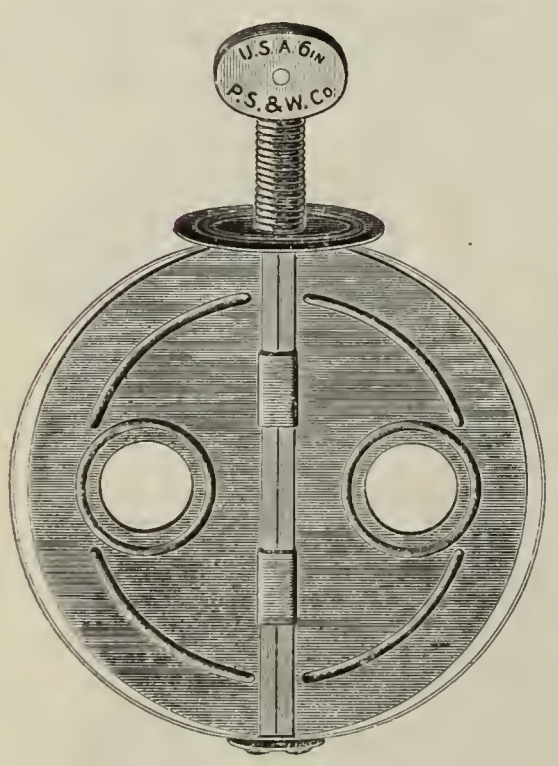
JOHN GALT & SONS, dealers in slate, who for 21 years past have been located at 52 John street, moved to 253 Broadway, where they have fine new offices in Rooms 805 and 806 of the Postal Telegraph Building. This firm are well known in the slate trade, and are especially prominent in handling roofing slate of all kinds.

Baird, Thompson & Co. of Glasgow and London have recently fitted a new system of ventilation in several British steam vessels, which is said to be highly successful. Downcast and uptake shafts are fitted at either end of the hold to be ventilated, and ejectors, worked by compressed air, are fitted at the bottom of the uptake shafts. A constant circulation of air through the hold is thus secured.

THE RETAIL STORE.

U. S. A. Damper.

The Peck, Stow & Wilcox Company, 27 Chambers street, New York, are introducing the U. S. A. damper, as here shown. The disk is made of sheet steel with two 1-inch holes cut for escape of gas. The shaft is of wrought iron ⅛ inch square bent double and pointed at the ends. On the side of the handle is a metal shield or disk to protect the double wood handle from heat. Between the handle and the shield is a tinned coil spring, put there to keep the damper rigid in any desired position. At the other end is a metal washer 1 inch in diameter, the pointed ends being spread or locked down with a chisel after the washer is in place. Holes ¼ inch in diameter are punched in the pipe on both sides. It is pointed out by the manufacturers that this damper is exceptionally light and that

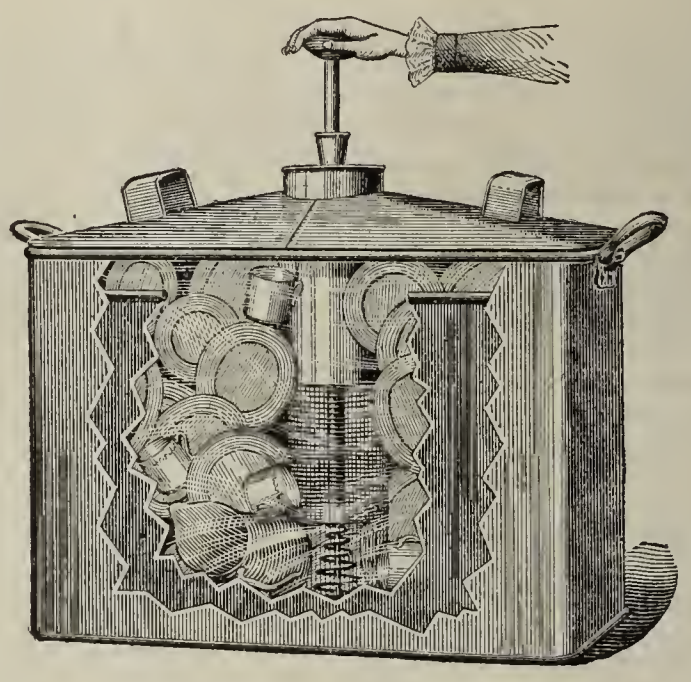


U. S. A. Sheet Metal Damper.

there is a proportionate saving in freight, and being of steel there is no loss from breakage, while the damper, if necessary, can with a pair of snip shears be cut to fit an oval, square or irregular size of pipe.

The Perfect Dish Washer.

The illustration herewith shows the Perfect dish washer, which is just being put on the market by Geo. B. Cobb & Co., 96 Centre street, New York. It consists of an inner and an outer vessel with a cover. The outer vessel has a faucet at one end for emptying. The inner vessel has a perforated bottom and a perforated cylinder attached to it with a spring and a plunger within it. In operation the outer vessel is filled with boiling water into which soap or washing soda is dissolved. The dishes are packed in the outer vessel around the cylinder and then set in the water and the cover put on. The plunger is then moved up and down, forcing the water to rush over the surface of the dishes to dissolve and remove all grease, &c. When the dishes are washed the water is drawn off and a supply of clean hot water poured in to rinse them. The water is again drawn off and the inner vessel raised, and by means of handles with projections which catch on the top of the outer vessel the dishes are suspended to drain, and being hot they dry without the use of a towel and are said to have their natural polish. It is said that 50 dishes can be washed in five minutes without risk of breakage. The device is made of tin or galvanized iron in two sizes and is specially designed for household use.



The Perfect Dish Washer.

Barrel Pan for Oil Barrels.

Sidney Shepard & Co. Buffalo, N. Y. are putting a barrel pan on the market, an illustration of it being given herewith. The apparatus consists of a pump, which is inserted in the barrel, and a pan surrounding it, the bottom of the pan being corrugated toward the pump aperture, thus draining all drippings of oil back into the barrel when pumping oil from the barrel. The pan is of ample size to accommodate measures, funnels, cans, &c. The different parts are referred to as well and substantially made, and the apparatus will, it is stated, fit any barrel and may be used with illuminating or lubricating oils.



Barrel Pan for Oil Barrels.

The Climax Sifter.

We show in the accompanying cut a broken view of the Climax flour sifter, made by the Climax Mfg. Company, 415 Cuyahoga Building, Cleveland,



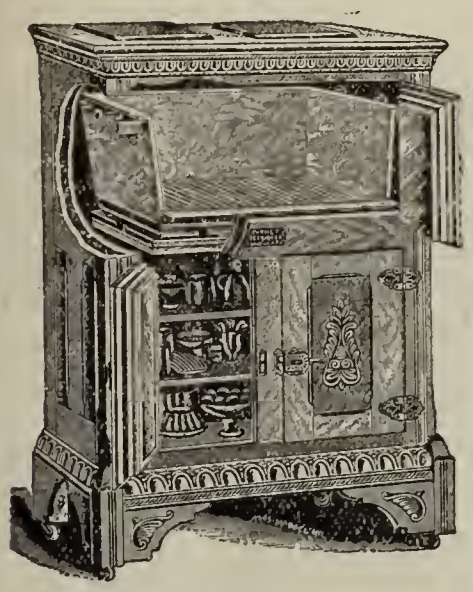
The Climax Sifter.

Ohio. It is especially adapted to sift flour and is about 6½ inches high and 5 inches in diameter. The handle, it will be noticed, is so arranged that by a slight shaking motion the sifter is put into operation. It is worked entirely with one hand and by an easy motion.

THE TROY NICKEL WORKS, Troy, N. Y., send out small cards illustrating and briefly describing the features of the Alaska tack hammer and of the Perfect ladies' tack hammer.

The Gurney Removable Ice Compartment.

The Gurney Refrigerator Company of Fond du Lac, Wis., have introduced a new feature in some of their refrigerators this season, in the form of a re-

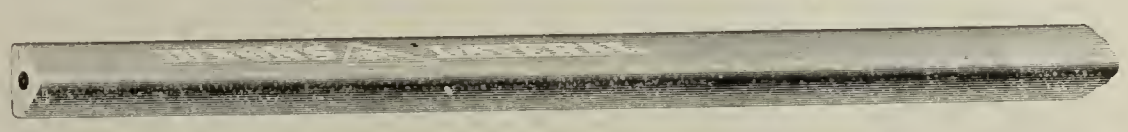


The Gurney Removable Ice Compartment.

movable ice compartment, which is here with illustrated. It is used in that class of refrigerators in which the ice is put in through the front. It is supported by a heavy galvanized frame running around the back and two ends of the refrigerator, leaving ample air space for the air from the provision chamber to gain access to the ice. The compartment can be so readily removed for cleaning that the merits of this style of construction are obvious. The company have very recently been granted a patent on their application of this idea to a refrigerator.

Trilateral Pencils.

Joseph Dixon Crucible Company, 68 Reade street, New York, and Jersey City, N. J., have brought out a new form of lead pencil, as here illustrated, called the Trilateral. Its triangular shape prevents it from rolling off a desk, fits the fingers and does not tire the hand with constant use. It is handsomely finished, to resemble ebony, rosewood, satin wood and natural cedar, is full length and made in all grades from soft to hard. It is remarked that to those using a pencil continuously it will be found especially convenient.



Trilateral Lead Pencil.

Improved Coffee or Tea Urn.

Thomas Miller & Son, 106–108 Centre street, New York, are bringing out an improved Economy coffee or tea urn, as shown in Figs. 1 and 2. The main difference between this construction and the former is that the coffee or tea when made is kept hot and at a uniform temperature never reaching the boiling point, by means of a bath of hot air instead of hot water. Fig. 1 represents the urn complete, except the portable burner underneath. Fig. 2 is a sectional view of the apparatus. A is the cover, B the outer jacket, C a perforated metal spray pan for evenly distributing the boiled water, so that each portion of the pulverized tea or coffee is thoroughly saturated as the water passes through the mass. D is a cotton

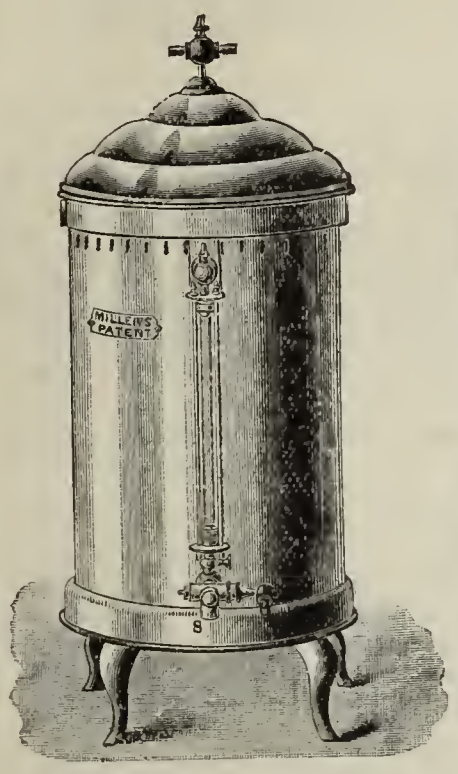


Fig. 1.—Economy Coffee or Tea Urn.

bag suspended from a wire rim, containing the tea or coffee. E is a stone crock receptacle for the tea or coffee, the enameling or glaze of which is guaranteed by the manufacturers not to craze. F is the hot air chamber between the jacket and crock, the supply of air entering at the bottom, and after being heated passes out through the perforations at the top, as seen in Fig.

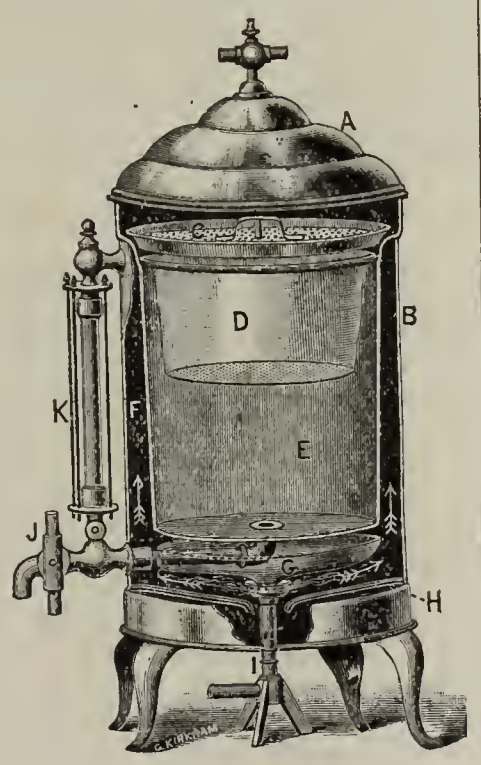


Fig. 2.—Sectional View of Urn with Burner Underneath.

1. By means of the cast iron diaphragm G, it is stated, the heat from the self-regulating gas burner I is radiated and evenly distributed, maintaining a constant bath or current of heated air against the crock E. The guard plate H is arranged to admit only a sufficient supply of air. I is an improved automatic self-regulating gas burner made for this service, although alcohol, oil, &c., can be used if gas is not available. J and K indicate the customary faucet and gauge glass. For a 4-gallon urn the manufacturers state the proper amount of heat costs but 2½ cents per day, with gas at $1.25 per thousand cubic feet. A glass eye piece at the bottom, 1⅛ inches in diameter, always affords a view of the burner. The urns are carried regularly in stock in capacities from 2 to 10 gallons, and larger sizes are made to order. They can also be furnished in sets of three with central water boiler and stone crock milk head with improved clean-out faucet.

MEMORANDA.

YATES & Co., Rockford, Ill., refer to their astringent lacquer as soluble, adhesive, tenacious and rust proof, and as proving a valuable acquisition to the stove dealer in making stove polish, rust proof varnish, rust proof roof paint, &c. The manufacturers state that upon application they will be pleased to mail to any dealer a pamphlet telling how to make a benzine paste stove polish at from 3 to 6 cents per pound that will prove a rust proof application and a durable jet black luster.

THE GEUDER & PAESCHKE MFG. COMPANY of Milwaukee, Wis., have issued a neat little pamphlet descriptive of the merits of their Cream City flour bin and sifter. The author of this publication has done his work in a most entertaining manner. Comparisons are made with the way in which "our mothers" used to get flour from a barrel, scraping against nails and spraining their backs burrowing in the barrel. The illustrations are effective, and in connection with the text show most happily the superior advantages of a flour bin and sifter over the ancient methods of handling flour in the kitchen.

C. SIDNEY SHEPARD & Co., 23 and 25 Randolph street, Chicago, have issued a spring circular of seasonable and other goods in their line as manufacturers of house furnishing goods in the sheet metal branch of trade. The circular covers 24 broad pages and gives illustrations and price-lists of water coolers, Lightning ice cream freezers, milk cans and can stock, creamery supplies, japanned bathtubs, cash boxes, dust pans, lamp stoves, family oil cans, tea and coffee pots, flue stoppers, flour sifters, egg poachers, mincing knives, conductor pipe, eave troughs, elbows of all patterns, sprinkling pots, gas stoves, tin plate, terne plate, mica, &c. The firm are manufacturers of a large line of deep and shallow stamped ware, pieced tinware and japanned goods.

March's failures in the United States were less than half, in number, compared with those of January last, while the proportion of capital involved was still smaller.

STOVE TRADE NOTES.

National Association of Stove Manufacturers.

In these columns last week we referred to the coming meeting of the National Association of Stove Manufacturers, and called attention to the plan which had been adopted with regard to papers to be presented at that time. As stated, the subjects to be covered were announced in our issue of March 31 in connection with the circular issued by Secretary Thomas. We now have pleasure in presenting below another announcement from the secretary's office, bearing date of April 21, and giving the names of the authors of some of the papers to be read before the National Association:

Allow me to remind you that the annual convention of the National Association of Stove Manufacturers will be held at the Auditorium Hotel, Chicago, on Wednesday, May 2, at 10 30 a.m., in accordance with my circular of March 24, a'so to repeat the cordial invitation to attend given by the president to all stove manufacturers, whether members or not. It is expected that papers of the greatest value and interest will be read and discussed. Among them will be an article on "A Theory of Ornamental Design as Applied to the Decoration of Stoves," kindly prepared by J. Leon Gobeille of Cleveland at the president's request; one on "Pattern Construction," prepared under the auspices of the Michigan Stove Company; one on "Foundry Management," by a gentleman now superintendent of one of our largest foundries, and whose competency is beyond question; two or more on "The Relations Between the Employer and the Employed," which will probably be written from different standpoints; one by Henry Cribben on "The Education of Apprentices and Maintenance of the Supply of Efficient Workmen;" one on "Cleaning Castings," by the good offices of the Abram Cox Stove Company; one on "Profit Sharing," by C. S. Prizer of Reading, whose paper last year met with such general commendation; one on "The Interchange of Information Among Stove Manufacturers," by the officers of the Fuller & Warren Company; one on "The Continental Stove Trade," by J. Goldschmidt, late United States Consul at Vienna, and others of general interest. It is hoped that there will be a full attendance of those gentlemen immediately connected with the productive department, as the meeting is expected to be of special interest to them, while there will be no neglect of topics connected with the distribution of goods.

W. H. Switzer, secretary and general manager of the Superior Furnace Company of Little Falls, N. Y., has recently returned from an extended business trip throughout the Western States, where he called upon the many patrons of the company, all of whom speak in glowing terms of the excellent results achieved in the past from the sales of this popular line of furnaces and heaters. We are advised that the prospects bid fair for a large increase of sales for the season of '94, judging from the many new agencies established by Mr. Switzer and the booking of some large orders for early shipment.

Electric Heating and Cooking Apparatus.

The likelihood that a vigorous effort will be made to utilize electricity for heating and cooking apparatus has induced the New York Board of Fire Underwriters to adopt the following special rules:

Electric Heaters, Ranges and Stoves.

a. These must be placed in safe situations (out of easy reach of inflammable materials) and separated from and supported on non-conductiug and incombustible standards or bases so as to be at least 4 inches from wood work of any descriptiou or other inflammable material, unless protected by non-combustible materials, such as sheet metal and asbestos, or the like, so combined as to prevent appreciable transmission of heat, while securing full insulation. The heating wires or resistauces of these heaters, &c., must be inclosed in non-combustible cases adapted to preveut accidental contact with exterior object or material.

These electric heaters, stoves, &c., must never be concealed, but must be at all times in plain sight.

b. They must have double pole switches, cut outs. &c , arranged as required for electric lights or power apparatus employing the same current and potential.

c. The attachments of feed wires to heaters, &c., must be in plain sight, easily accessible and protected from interference, accidental or otherwise.

d. Attachment of conductors to heaters, &c., must be securely made in the same manner that conductors are attached to motors or generators dealing with currents equal to those employed in these devices, and such conductors must be coutinuous from the heaters, &c., to the switch or cut out, which must not be within 2 feet of said heaters, &c. These conductors must be thoroughly well insulated and also covered with a good mechanical protection.

Portable Cooking Apparatus, Glue Pots, Curling Irons, &c.

a. The heating coils or resistances of these instruments must be inclosed in non-combustible cases, which in turn must be mounted on non-conducting and incombustible bases raising the same at least 1 inch from any surface on which they stand.

b. These instruments must not be attached to lamp sockets, and when current of more than 10 ampères is required they must conform to the same rules as heaters, ranges, &c.

c. Where currents of 10 ampères or less are required these instruments may be connected by specifically approved flexible double or twin wire conductors, provided such conductor is composed of two multistrand conductors, each of which is insulated by a water proof material and asbestos, while both are surrounded by a covering affording adequate mechanical protection. These flexible cords must also be connected to plug switches having double pole fuses in their sockets which will cut out the circuits if a cross connection should occur in the flexible conductor. Moreover, such plug switch must be so arranged that the plug will pull out and break the connection if an abnormal mechanical strain is brought on the flexible conductor.

The leading in wires of these flexible cords must be connected to heaters or the like at the point of lowest temperature, and where such wires are detachable at the heater, their terminals must be arranged with female ends protected by porcelain extending at least ⅛ inch beyond the metal terminals.

If the connection at the heater is fixed, a separable double pole connector must be placed in the circuit, so that in case an undue strain is brought on the conductors the device will be automatically cut out and disconnected.

Flexible cord connections longer than 6 feet will not be permitted.

Receptacles for plug attachments must be placed at least 6 inches above the floor.

Where switches are provided they must conform to the rules laid down in Section 26 of the General Requiremeuts.

Where a number of utensils are grouped for general cooking service, installations to be approved must be provided with slate, soapstone or other approved slab or table for utensils to rest upon. Plug receptacles mounted on slate or other approved material shall be attached to mains running at least 6 inches above the working service of the table.

Sad irons and other heating appliances that are intended to be applied to inflammable articles, such as clothing, must be arranged as above as far as connections, &c., are concerned, aud must also be provided with approved attachments which will cut off current when they are not in actual use.

The leading in wires to these forms of apparatus must be connected through porcelaiu connecting blocks, and the cable or cord of the same must be passed through an insulated elastic spiral or spring so arranged as to protect the same from kinking, chafing or like injury at or near the point of connection.

These conductors must be so placed that they will at all times be at least 4 feet from the floor and well protected against contact with water pipes or other possible ground connections.

The use of no flexible cord will be permitted, unless specifically approved by this board.

Gas for Fuel.

At the tenth annual meeting of the Ohio Gas Light Association, held at Columbus, Ohio, March 21–22, a paper by Donald McDonald on the subject of gas for fuel was presented. In his opening remarks the author enumerated some of the forces working from different directions tending toward the increased use of gas as a fuel, and also referred to a few of the forces which are retarding it. Among the latter he states that one is the attempt to use gas for purposes where its cost and other properties make its failure a foregone conclusion. "For cooking or for occasional fires," he says, "gas can be used with economy at $1 a thousand, but the man who attempts to heat a bedroom or an office with it at that price will certainly become disgusted with the whole business, and will very properly blame the gas company that induced him or allowed him to waste his money on such an experiment. With a good gas at 50 cents a thousand, all sorts of cooking can be done with it, and the heating of parlors and dining rooms, and those bedrooms which are not used as sitting rooms during the day, can be done at a cost so little greater than the cost of coal that people will put up with it on account of the greater convenience of gas. At 35 cents a thousand for a good gas containing, say, 700 heat units, gas can be used as a heating agent all over a residence, and the cost will not exceed

that of anthracite coal at $8 a ton or soft coal at $3.50 a ton, after allowance is made for kindling and labor. . . . If gas at 50 cents a thousand is burned in a good gas stove in a tolerably close room without any chimney draft, the products of combustion escaping into the room, the amount of gas required to heat the room will be so small that coal will not compete with it in price. The room, however, if it is small and close, will become unfit for habitation, owing to the consumption of the oxygen of the air and the formation of carbonic acid and watery vapor. . . .

"A room 16 x 16 x 12 contains about 3000 cubic feet, and will require 2177 heat units in order to bring its temperature up from 30° to 70°. If the combustion is perfect, and there was no other loss than that due to the actual products of combustion escaping at 300° F., such a room should be heated from 30° up to 70° with a consumption of 3 feet of gas per hour; or assuming that the air is changed three times per hour, and that there is no loss through the walls or windows, 9 feet of gas per hour would keep such a room warm.

"I was so much surprised at this low figure that I constructed a gas stove on this principle. It was of sheet iron, so made that no air could enter it except what was necessary for combustion, and this air was compelled to enter it at the very point where the flame originated. This I accomplished by using the ordinary burner composed of a piece of ¾-inch gas pipe, with holes ⅛ inch in diameter drilled 1 inch from centers and fitted on the end with an ordinary mixer and stop cock, so arranged as to take in air and gas mixed, and provided with valves so that the amount of air and the amount of gas taken in were capable of absolute adjustment. This burner was placed inside of a 2½-inch pipe of the same length, with holes ⅝ inch diameter, in such a way that the jets of mixed air and gas issuing from the small pipe were projected through holes in the larger pipe, and, of course, met a supply of perfectly pure fresh air, drawn in from the outside. The stove was connected to the chimney by means of a 4-inch flue pipe and there existed at all times a vacuum in the stove, so that whatever leaks accidentally existed in it served to take in air, but never to permit the escape of the products of combustion.

"I found that with this stove I could maintain the temperature of a room 16 x 16 feet with a 12-foot ceiling at 68° while the thermometer outside varied from 25° up to 35°, the consumption of gas being only 13 feet per hour; and the room being at all times sweet and wholesome.

"I drew some air out of the interior of this stove and analyzed it, and found that its composition was as follows: Carbonic acid, 6½ per cent.; oxygen, 7 per cent.; and the remainder was, I presume, nitrogen. Of course, such an atmosphere as this would be absolutely fatal to any kind of life in a little while. A lighted candle placed inside of the stove goes out in a few minutes, and even a stream of gas poured in against the flames refuses to light, for lack of oxygen with which to burn.

"Now, let us assume that instead of allowing these products of combustion to escape up the chimney, we allow them to escape into the room; the result would be that at the end of the hour the room would contain 13 feet of carbonic acid and a considerable quantity of watery vapor and would have its supply of oxygen depleted by about 26 feet. Thus we have in one hour lowered the oxygen to 19 per cent. and raised the proportion of carbonic acid from four parts in 10,000, at which it originally was, to 48 parts in 10,000, which is a great deal more than any of the authorities on ventilation allow and which does as a matter of fact render the room in question exceedingly oppressive.

"Of course the amount of gas required to heat the room by this last method is somewhat less, but the difference is evidently not worth the cost at which it is obtained.

"In pursuing this inquiry, I have examined the cuts of all the gas burning appliances which I could obtain; and in none of them do I find any attempt to separate the products of combustion from the surplus warm air before they reach the chimney. They all go on one or two theories; the first is to carry nothing up the chimney and allow everything to escape into the air of the room. This may be described as very cheap and very nasty. The other plan is to provide ample chimney draft, and let the householder pay the bill. This is healthy enough, but it is very expensive.

"I feel certain that gas will eventually take its place as the principal heating and cooking agent of the people. Before it can do so, however, the managers of gas companies must be prepared not only to make a good gas and sell it cheap, but also to instruct their patrons how to burn it so as to secure economy in the cost and a wholesome atmosphere in their houses. As long as the public have to choose between extravagant gas bills and close, oppressive rooms, the progress of gas for heating will be slow."

The Chicago Stove Trade.

If a report on the condition of the Chicago stove trade should be based entirely on what one or two manufacturers say, it would be very short. In reply to questions about trade they reply laconically, "There is none." Of course, they do not mean to be taken literally. They have not closed their foundries, called in all their traveling men, and made arrangements for going into liquidation. Their shipping departments are still fully manned and their order books pass no dates but Sunday. Their teams may haul occasional loads of flour or salt or miscellaneous merchandise, to earn an honest penny outside, but they have not entirely ceased to haul stoves. The expression referred to is simply used to emphasize the dullness prevailing. There is a stove trade in Chicago at the present time, but it is not up to what it should be. The influences which have dominated all kinds of business for the past twelve months are still in full force and effect, and the stove trade is obliged to suffer with every other branch of trade.

So far as the demand for stoves has existed its character has not differed radically from that of previous springs. Cook stoves and ranges have constituted the bulk of the business in staple goods. Advance orders have been taken for some heating stoves to be delivered in the early fall, but not to any great extent. The orders for cooking goods have been much smaller than in other years. Merchants will not anticipate their requirements, and regard the purchase of six stoves of six different patterns as a large order. In most cases, in fact, merchants are not ordering stoves until they are absolutely certain that they can sell them. This bareness of stocks, however, often brings about an accumulation of orders in the manufacturers' shipping departments which for a brief time restores at least a semblance of activity. The city trade this spring has been much smaller than that originating in rural districts. This is partly due to the hard times, which are felt most severely in cities, but is also ascribed to the large numbers of second hand cooking stoves thrown on the market shortly after the World's Fair by temporary sojourners in Chicago who had engaged in housekeeping during their stay. The number of these birds of passage was much larger than would have been supposed.

Some peculiar features of current trade may be especially noted. While a certain demand exists, and always will exist, for the highest priced stoves and ranges, yet the reduction of incomes and lowering of wages have caused a general turning to medium priced goods. This movement is recognized by manufacturers and is to some extent encouraged by them. Their medium priced goods are now of a much higher grade than ever before and they substantially offer a first class article for the lower rate. This is seen in steel ranges as well as in cast goods. The very best grades are held at high prices because manufacturers claim that they cannot be made to sell at any reduction, but they are offering very fine ranges, which they term medium priced goods, at much more reasonable rates, and find that these are reaching the people. Another feature of recent trade is that successful trips are reported by salesmen who have canvassed the very small towns which are usually neglected in ordinary times. Residents of such towns, being more closely identified with agricultural interests than in larger towns possessing manufacturing establishments, do not feel the depression in trade so seriously and are not economizing so rigorously. Notwithstanding the demagogic cry that farmers are in a chronic state of poverty, perpetually ground in the dust by the "money power," the farming communities of the West are found to be in much better shape than manufacturing communities. They may not enjoy all the sweets of prosperity occasionally tasted by manufacturers, but, on the other hand, they are not obliged, as now, to drain to the dregs the bitter cup of adversity.

The Kernan Furnace Company, formerly 59 Wabash avenue, Chicago, have moved their office to 71 and 73 West Washington street. The co

pany will discontinue the retail branch of their trade, which will be in charge of W. J. McKay & Co., at the above location.

ODD PLATES.

The Prince Royal hot air furnace, made by Hart & Crouse, Utica, N. Y., is placed at the front of the New York showroom, at 211 Water street, by Manager W. M. Mackay. It is popular on account of being very low, giving a good pitch to hot air pipes, and having three No. 14 steel radiators it has a good heating capacity. Another feature is, the central dome being very large, excellent service is secured by the water heating coil when it is used as a combination heater.

W. Lapp & Co., 8 Peck slip, New York, make a specialty of sheet iron goods. They manufacture oyster ranges, broilers, pastry ovens, confectioners' and tinners' furnaces, as well as a line of coffee urns and broilers.

The Chicago & Erie Stove Company of Erie, Pa., have issued a circular showing the popularity with the trade of the Helper steel range, which they manufacture. The circular bears a letter from a customer in Parish, N. Y., in which he tells of the success in the way of sales resulting from a personal visit to the people in that section of the country and a demonstration of the merits of the stove named. The customer took the ranges in his wagon, and driving through the country showed the people how they would bake in the open air in the coldest weather and disposed of large numbers. By peddling out the stoves in this way the customer states that he has them favorably introduced and is certain of building up an extensive trade.

The Fuller-Warren Company of Milwaukee and Chicago favor us with copies of three pamphlets relating to warm air furnaces. One of the publications is devoted exclusively to wood burning furnaces made both horizontal and vertical, and another relates to the company's top return flue furnace adapted for hard or soft coal. This heater is made with cast radiator and is offered in portable form and also arranged for brick work. The third pamphlet relates to the same general line and presents in addition the details of construction. These goods are offered in a great variety of styles and sizes suitable for warming buildings of all kinds. The company have had more than 50 years' experience as heating and ventilating engineers, and are thoroughly familiar with the requirements of the public in this respect.

The Perry Stove Company of Albany, N. Y., have issued a convenient pamphlet telling of various kinds of oil and lamp stoves, among the number being two new constructions. One is the Royal F, an oil stove with four 4-inch burners, permanent extension top with four cooking holes and loose divisions, front and back. The body of the stove is of cast iron, nickel plated. The other new feature is a Royal lamp stove with two 4-inch burners, and is highly finished in nickel and japan. It also has the company's special burner, which is oil tight, and Russia iron chimneys with removable mica.

The Lehigh Stove & Mfg. Company of Lehighton, Pa., are favoring their friends in the trade with blotting pads of a size which renders them convenient for desk use. The paper is of yellowish tinge and carries printed matter in red. The inscription is to the effect that "Lehigh stoves and ranges are made only by the Lehigh Stove & Mfg. Company of Lehighton, Pa."

The Davis, Johnson Company have opened an agency for the sale of Schill's New Idea furnace at 45 East Jackson street, Chicago. The New Idea furnace is manufactured by Schill Brothers, at Crestline, Ohio, and is adapted to the use of hard and soft coal, coke, wood and gas. This furnace has been on the market but a short time, yet the manufacturers have already built up a large trade for it. They have added some improvements for 1894 which they are confident will win for it still greater favor.

The Thatcher Furnace Company have issued an announcement under date of April 23, to the effect that on account of increased business they will remove May 1 to 240 Water street. This location is central, and with the more commodious quarters which they will occupy gives the company much better facilities for exhibiting their line of goods and for carrying a larger stock than heretofore.

The Chicago & Erie Stove Company of Erie, Pa., send us a copy of a circular which they are about mailing to the trade relative to the Gas Helper range. The top surface of the range is provided with four burners having central draft and sawed on the side so they are not liable to fill up. It is also claimed for these burners that they are very economical, because they spread the flame into thin sheets, thus securing a large amount of heat in proportion to the quantity of fuel used. The two burners under the oven are easily lighted from the side by an ingenious device. The oven is made of light iron so that it will heat quickly and is mounted on a cast iron frame that fits to the front and can be drawn out as a drawer from a bureau, by lifting out two rivets at the bottom front.

The Baxter Stove Company of Mansfield. Ohio, have issued, under recent date, an announcement to the effect that, having just completed the adjustment of the losses sustained by the fire which visited their works on April 5, they are now prepared to close out their stock of Baxter's Banner stoves which were stored in the warehouse at the time of the fire, and which were somewhat damaged thereby. These stoves, we understand, were not subjected to the direct action of the fire, but were only damaged by water. They were promptly dried off and all nickel work replated, so that they can be cleaned and blackened with but little labor and retailed at prices fully as good as new stoves. With the circular letter the company are sending a list of the damaged goods which they will sell, subject to prompt reply, at specified discounts from list prices.

E. L. Tallmadge, formerly with Janes & Kirtland, has connected himself with the house of Eugene Munsell & Co., 218 Water street, New York, where he will act in the capacity of shipping clerk. He is well equipped for this service, as he is equally skillful in marking with either hand, which is a gift by no means common.

The Superior Furnace Company of Little Falls, N. Y., inform us that after May 1 all shipments of Superior furnaces, heaters and ranges to the Western trade will be made directly from their works, thus dispensing with the expense attending the carrying of a stock in Chicago for reshipment. In view of this fact all orders and communications should be directed to the company at Little Falls, N. Y., where they will be given prompt attention.

The Boynton Furnace Company, 195 and 197 Lake street, Chicago, have issued an important circular to the local trade, under date of April 20. In it they say that in addition to their large wholesale trade throughout the country they have been doing construction work in Chicago and suburbs for over eight years. During that time they have put in thousands of heaters and gained a high reputation. They continue: "We have decided to try a new departure—to discontinue construction work and, so far as possible, distribute this part of the business through the retail trade. We shall continue to advertise the goods as heretofore, and have a sufficient corps of competent salesmen who will canvass the city and suburbs, interesting parties so far as possible using our heaters and ranges, and we desire the co-operation of the local dealers who may feel interested in this new departure. If we can secure sufficient encouragement as manufacturers and wholesalers that the sales of our goods will not be lessened, this plan of operation will be permanent. It will cost us something to make this experiment, but we venture it with a hope that it will be a success for the retail trade as well as ourselves."

The Central Electrical Heating Company, 26 Cortlandt street, New York, are installing a complete electrical kitchen in the United States receiving ship "Vermont," at the Brooklyn Navy Yard.

Duparquet, Huot & Moneuse Company, 43-45 Wooster street, New York, manufacturers of French ranges and hotel and restaurant cooking apparatus and utensils, are engaged in fitting up the kitchen for the Hardware Club in the Postal Telegraph Building. They also fitted up the kitchens of the Metropolitan Club. at Sixtieth street and Fifth avenue, the Girard Hotel, Forty-fourth street and Broadway, and the Arkwright Club, at Broadway and Duane street. The culinary department of the Insurance Club, in the Mutual Reserve Building, was equipped by them.

The Smith & Anthony Company of 48-54 Union street, Boston, Mass., have taken the agency for the Splendid oil cook stoves, the special features of which consist of steel bodies and tops and brass burners and tanks. Outwardly these goods have much the appearance of gasoline stoves, which they are intended to replace. The burners are very powerful, one of them having a 15-inch wick. The Smith & Anthony Company control this line of stoves in the New England States and are in a position to promptly handle all orders with which they may be intrusted.

C. B. Baker, 52-54 High street, Cleveland, Ohio, recently issued an announcement to the effect that on April 5 the partnership heretofore existing between him and W. S. Myers was dissolved by mutual consent. The business will be continued at the place named by Mr. Baker.

The recently appointed postmaster of Corning, N. Y., is George W. Drake of the Corning Stove Company of that place. Mr. Drake is probably one of the youngest postmasters in the country, he having been born Novem-

ber 10, 1870, in the little town of Arnot, Pa. From a brief sketch of his life presented in one of the local papers, we learn that after spending his childhood days among the miners he moved with his parents to Corning. He was educated in the Corning Free Academy and in Holbrook's Military Academy, at Sing Sing, from which institution he graduated. Soon after he was engaged in his grandfather's bank, holding the position until three years ago, when he became identified with the Corning Stove Company. Mr. Drake's likeness appeared recently in the "Elmira *Telegram's* Picture Gallery of Prominent People."

RATHBONE, SARD & CO. exhibit on the sample floor of their Chicago house a specimen of their new steel Acorn range. This is a very handsomely finished but moderate priced steel range. It is furnished with high closet or high shelf, bracket reservoir or water front. The fire pot has double draft, both in front and at the side, so as to secure perfect combustion. It is fitted with a duplex grate, and the deep ash pan is made of planished steel. Special care has been taken in the trimmings. The edges of the high shelf are nickel plated and not merely polished. Nickeled pilasters of ornamental design cover the front corners, and a cornice extends along the bottom, which is usually left square and unrelieved. Very heavy nickel bands extend round the several doors. The high closet has a canopy top. In the high shelf there is a panel on each side of the pipe which forms a convenient tea pot shelf. These panels are hung on pivots near the bottom, so that the top swings over when needed for a shelf. The bottom is weighted, and the shelf swings up again when relieved of its burden. The oven door is so made that it can be held open ½ inch so as to ventilate the oven or cool it off. The walls are lined with asbestos, which is covered with an iron grating so that it cannot be torn off. Six sizes are made, but the fire chamber fixtures are interchangeable in all, thus permitting a smaller stock of repairs to be carried, which is a feature that will be appreciated by dealers. This range is made with 18, 20 and 22 inch ovens and with four and six cooking holes. The line is thus complete in every respect.

THE PENINSULAR STOVE COMPANY are bringing out a new heater, to be known as the Air Tight Peninsular. It is an incased stove with interior construction after the style of an oak stove. The exterior work will be very ornamental, so that the stove will be fitted for use in richly furnished rooms. It will be made in three sizes to suit all requirements.

EDMOND RAFTERY, assistant manager of the Chicago branch of Rathbone, Sard & Co., sails for England on May 5, for a two months' visit to relatives.

THE PENINSULAR STOVE COMPANY of Detroit, Mich., have just completed and placed upon the market a new soft coal heater which is known as the Air Tight Peninsular. It is offered in three sizes, at a low price, and is ornamented in an effective style. The outer cast section is open fretwork, connected with openings in the extreme bottom, thus allowing for a free circulation of air and forming a complete double heater. The stove, as its name implies, is air tight, having few joints and these carefully fitted. The inner body is made of No. 12 cold rolled wrought steel, thus insuring, it is claimed, quick and powerful radiation, and at the top of the body of the heater is a heavy globe dome so arranged as to conduce to perfect combustion.

THE UNION STOVE LINING COMPANY of Weir Village, Mass., recently closed their plant owing to business depression, but it is intimated that the works will resume as soon as the situation improves. The company have been working full time right along, and when they resume operations they hope to be able to continue with a full force.

A. T. MATTHEWS, general manager of the Matthews Mfg. Company, Worcester, Mass., makers of steam pipe collars, ferrules, stove trimmings and seamless sheet metal specialties, has returned to Worcester after a very enjoyable Western trip, during which business and pleasure were combined in about equal parts.

THE ENTERPRISE STOVE WORKS, at Vincennes, Ind., shut down for a few days, a week or two since, in order to make some necessary repairs.

THE CARMICHAEL-WILKS RANGE COMPANY of Chicago have recently been incorporated, with a capital stock of $50,000. The incorporators include D. L. Carmichael, W. B. McCloud and Perry Russell.

THE INDIANAPOLIS STOVE COMPANY of Indianapolis, Ind., are now running full time with a force of 100 men. President Bennett states that there is no rush of orders, but enough are received from time to time to keep the works running with the force named.

THE CARTON FURNACE COMPANY of Utica, N. Y., have brought out a new heater known as the Carton hot blast smoke burning furnace, with vertical combustion flues. It is made of cast iron without the use of bolts and is claimed to operate without soot, dust or gas. The manufacturers state that the furnace has been thoroughly tested and every heater is guaranteed.

THE BELLAIRE STOVE WORKS of Bellaire, Ohio, which have been closed for several months, resumed operations last week with a force of about 200 men. We understand that the company have a fair amount of business on their order books and expect to run regularly until July 1.

THE FULLER & WARREN COMPANY of Troy, N. Y., have nearly ready for mailing to their friends in the trade circulars of two new ranges. One of these is a double oven range made in portable form and also adapted for brick work, while the other is a single oven range bearing the name Stewart. The latter has a large square oven and is also provided with the company's patent oval fire box with their triple interchangeable grates — namely, the Dockash, triangular and draw center. In fact, the manufacturers state that all their ranges are now made with these three grates. We also understand that the company have just completed a basket grate for wood which can be used in any of their fire boxes.

SCHILL BROTHERS of Crestline, Ohio, have brought out a pamphlet for 1894 containing a long list of testimonial letters from some of those who have used their furnaces. The last page of the pamphlet illustrates and describes a recent addition to their assortment which is being offered under the name of the Schill furnace. This is said to contain all the fuel saving and heat producing qualities that have made the New Idea so well known, and has patent center draft, diving flue, double fire pot, shaking and drop center grate, asbestos packed joints, cast front and heavy castings. The dimensions are the same as the New Idea except the drum, which is 26, 30, 36 and 40 inches in diameter in the various sizes.

THE ART STOVE COMPANY of Detroit, Mich., favor us with copies of two catalogues neatly bound in colored paper covers which they have issued to the trade. One relates to the Laurel steel range, which is made with the modern features and is offered in a great variety of styles and sizes. This range, we understand, has proven very popular, and can be furnished with a water front or hot water reservoir, as may be preferred. The second pamphlet illustrates and describes the Laurel oil heaters, which embrace sheet iron drum constructions as well as lamp stoves. Among the assortment is a combination heater arranged with a top cooking surface, provided with two boiler holes. The construction is termed a parlor cook stove, and being mounted on rollers can be easily moved from room to room. The manufacturers say that these goods are meeting with gratifying success, and that among other places they have been used by the pupils of the Chicago Cooking School. A few pages are devoted to the Laurel ovens, drums for the Art Laurel stove, cooking tops and Laurel wicks.

THE QUICK MEAL STOVE COMPANY, St. Louis, report an excellent trade for the Quick Meal gas and gasoline stoves. A recent letter from a customer in Louisville, Ky., contained the following: "Notwithstanding the hard times we are meeting with splendid success with the Quick Meal stoves, and think we will sell as many, if not more than we did lsst year." Their traveling men are sending in encouraging reports, and all things considered, they are well satisfied with the outlook.

OBITUARY.

ALFRED HOPKINS.

Alfred Hopkins of Bridgeport, Conn., well known to the plumbers of his own State and to those who have visited the different National conventions, died at his home very suddenly last Wednesday afternoon from rheumatism of the heart. For more than 40 years he has been engaged in the plumbing and stove business on Water street, Bridgeport. He was 62 years of age. and is survived by a widow, a son, William P., and a daughter, Mrs. L. E. Sage.

W. H. Hill's stove and tinware store, at Marlboro', Mass., was badly damaged by a fire which visited the Burke Block in that city on April 26.

There is a probability that the pottery troubles which have agitated Trenton, N. J., for so long may be settled by an agreement between the manufacturers and the men before the end of the present week. About 4000 operatives have been locked out in that center of the pottery trade since last January.

The umbrella trust is reported to be in a state of disintegration. The combination was formed about two years ago with a nominal capital of $8,000,000, and included most of the leading manufacturers. It is not, however, proving remunerative, and has not served to quell competition.

TRADE REPORT.

The Iron Market.

The market shows an improving tendency, and while prices are about the same it is easier to do business than it has been for a long time past. Consumers' requirements are widening, and in many cases deliveries are called for with the utmost urgency, showing that stocks are low, and that whatever demand there is must be supplied from new purchases. The amount of business done during the past two weeks is larger than for any similar period since last summer, and while there may be somewhat of a pause during the remainder of the month, there is good reason for believing that the improvement is genuine and likely to be maintained for some time to come.

The labor troubles are the principal element of uncertainty in the situation at the present writing. The general strike of the Bituminous Coal miners and that of a portion of the Connellsville Coke workers may, if lengthened out, seriously affect some of the mills and furnaces.

The strike in Alabama would influence quite different interests if established and continued. It would touch the founders throughout the country. As yet all the furnaces in the Birmingham district are running and the chances seem to be against the men, many of whom recognize that since there has been no change in wages in the last five years, in spite of the enormous shrinkage in the price of Pig Iron, a reduction is a necessity.

One of the interesting transactions of the past week has been the closing of an 85-mile Wrought Iron Pipe contract for the natural gas belt at Lafayette, Ind. A works on the Delaware River has captured the lion's share of the order, from 50 to 55 miles, while the balance is taken by Pittsburgh. Eastern Pennsylvania mills are to furnish the material for that part of the order which goes to their section.

Pig Iron.—The event of the week, so far as the New York market is concerned, is the announcement that the rate on Pig Iron from Birmingham to New York, rail and water, has been reduced to $3.50, a cut of 50¢ a ton. It is not surprising in the present condition of affairs that sellers are promptly giving away this reduction to buyers. As yet sellers of Alabama Iron in this market do not seem to have received any positive instructions to withdraw. It is reported that Buffalo furnaces have swept the Canadian market, making large sales of that Iron, with some Southern brands for mixing with it. We quote standard brands $12.50 @ $13.25 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.75 @ $10.25.

The demand for Pig Iron in the Philadelphia market has been very satisfactory, and while prices are in some cases the lowest, there is nevertheless a better feeling. In standard Foundry Irons there is a steady run of orders, and furnaces are in better shape than they have been for some time. There is a little irregularity in prices, due to the difference in freights to certain points, but on the whole the situation shows improvement, mainly in the better demand, which, however, is a necessary preliminary to better prices. General quotations for Philadelphia or equivalent points are about as follows:

Standard No. 1 Foundry X	$12.50	@	$11.85
Standard No. 2 Foundry X	11.75	@	12.25
No. 2 Plain	10.75	@	11.00
No. 1 Soft	11.50	@	12.00
No. 2 Soft	10.75	@	11.00

In Chicago the trade in local Coke Irons has latterly been confined to carload orders almost entirely, but they have been fairly numerous. Advices received from the Southern furnace companies state that they are very much disturbed over the strike among the Coal miners. Consumers, however, are not buying much Southern Iron at present, so that the strike in the South will hardly cause much annoyance in this section. Prices thus far have not been affected. The greater part of the trade now occurring is with country customers, as the city foundry trade has been decidedly curtailed by the local building troubles. Lake Superior Charcoal continues very quiet. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00	@	$15.50
Local Coke Foundry, No. 1	11.25	@	11.50
Local Coke Foundry, No. 2	10.50	@	11.00
Local Coke Foundry, No. 3	10.00	@	10.50
Local Scotch	11.50	@	11.75
Ohio Strong Softeners No. 1	12.60	@	13.50
Southern Silvery, No. 1	.....	@	11.50
Southern Silvery, No. 2	.....	@	11.00
Southern Coke, No. 2	10.00	@	10.35
Southern Coke, No. 3	9.75	@	10.00
Southern, No. 1, Soft	10.25	@	10.50
Southern, No. 2, Soft	9.75	@	10.00
Tennessee Charcoal, No. 1	15.00	@	15.50
Tennessee Charcoal, No. 2	14.50	@	15.00
Alabama Car Wheel	17.85	@	18.00
Jackson County Silvery	15.00	@	16.00
Other Ohio Silvery	12.50	@	13.00

The Coke strike is the disturbing influence in the Pittsburgh district, and will probably cause an advance in the market prices of Pig Iron. Foundry Irons are in very light demand, the foundries, as a rule, not being employed to more than half capacity. A sale is noted of fifty tons No. 2 Foundry at a price equal to $10.25, Pittsburgh. Quotations are given as follows:

No. 1 Foundry	$11.00	@	$11.25,	cash.
No. 2 Foundry	10.25	@	10.50	"
No. 3 Foundry	9.75	@	10.00	"

There has been little or no business in Pig Iron in Southern markets during the week, for the furnaces were not disposed to take orders for fear they might not be able to obtain Coal for an indefinite time, although they do not look for a prolonged contest. On the other hand, consumers of Iron do not require immediate supplies and are getting enough on contracts for their current necessities. Quotations are merely nominal, as follows:

Southern Coke, No. 1	$10.25	@	$10.50
Southern Coke, No. 2	9.25	@	9.50
Southern Coke, No. 3	8.75	@	9.00
Ohio Soft Stone Coal, No. 1	14.50	@	15.50
Ohio Soft Stone Coal, No. 2	14.00	@	14.50
Lake Superior Coke, No. 1	12.50	@	13.00
Lake Superior Coke, No. 2	11.50	@	12.00
Hanging Rock Charcoal, No. 1	17.00	@	17.50
Hanging Rock Charcoal, No. 2	16.50	@	17.00
Tennessee Charcoal, No. 1	13.00	@	13.50
Tennessee Charcoal, No. 2	12.00	@	12.50
Standard Southern Car Wheel	16.25	@	17.00
Lake Superior Car Wheel and Malleable	16.25	@	16.75

Metal Market.

Pig Tin. — Prices have averaged somewhat below the highest point reached last week. On prompt deliveries 19.50¢ net cash for 5-ton lots was touched. May and later deliveries could have been secured at 0.5¢ @ 0.10¢ discount. From the extreme lowest figures a slight reaction took place toward the close, carload lots having been sold at 19.60¢ net cash during the past few days. There has been very little speculative business and not more than fair average buying for interior account or for consumption. Fresh supplies continue to be quite in line with the consumption. At the close the market seemed quite stiff, with prices on the basis of 19.60¢ @ 19.65¢ net cash for Straits, prompt delivery. Jobbing prices for small lots are unchanged at about 21¢ @ 21½¢ for Straits Pig and 22¢ @ 22½¢ for Bars.

Copper.—The strike on the Great Northern Railroad has seriously interfered with mining and smelting operations in Montana. That interference, in turn, has caused some operators to purchase supplies in other quarters to fill outstanding contracts. In one instance about 300,000 lb Electrolytic were taken at 9½¢ for such purpose, and it is understood that other purchases have been made. Apart from this the market is bare of new feature, only routine business being under way in Lake Superior Ingot or Casting Copper. Prices have varied in a slight degree only from 9½¢ and 9¢ @ 9⅛¢ for the respective varieties. The consumptive demand continues moderate and the volume of orders and inquiries received by dealers is still below the average. Prices remain at the level of the past few weeks, with a tendency to harden. Small lots of Lake Ingot from store are quoted at 10½¢ ℔ lb.

Sheet Copper.—Merely a routine business is doing in this material. Orders are mainly for small lots for present use; and there is yet little indication of any general replenishment of attenuated stocks. Cornice makers are waiting for better encouragement from the building industry.

Pig Lead.—Business here has been unimportant and involved only a few hundred tons all told. The transactions were mostly at 3.45¢ @ 3.47½¢, with single carloads at the last named price. There is no change in the general situation save that buyers in this vicinity are more reserved and not bidding 3.45¢ as freely as they did a week ago. Speculative interest is still extremely tame and consumers evince but little interest in buying at the present time. For small lots of Pig 3⅞¢ @ 4¢ ℔ lb is the ruling quotation.

Spelter.—Sharp competition, in which two of the largest Western producers figured most prominently, has some-

what demoralized the market, and at present values are very uncertain. Sales have been made of common Western at 3.50¢ delivered here, prompt shipment, and some lots were purchased at 3.25¢ in St. Louis for Eastern account. In the face of this bids were made on 'Change of 3.52½¢ @ 3.57½¢ for July and later deliveries. Latterly there has been more or less curtailment of production, equivalent, it is estimated, to 25,000 tons per year. This was due mostly to loss in selling at late prices.

Sheet Zinc.—The manufacturers have reduced the price of Sheet Zinc still further this week. The demand continues quite limited, however, and prices for jobbing quantities show no change.

Antimony.—Merely routine business has passed, but enough of it to keep prices quite steady at 8¾¢ @ 8⅞¢ for Hallett's and 10¢ @ 10⅛¢ for Cookson's, with a premium of about ¼¢ on small lots.

Nickel.—The popular price for round lots is 40¢. Small parcels bring 3¢ @ 5¢ more. Only routine demand is experienced here.

Tin Plates.—As regards imported Plates, business has been exceedingly slow. Wholesale orders for spot goods have fallen below the average, and in numerous instances sellers have shaded the prices generally quoted to the extent of 5¢ ℔ box on orders involving only a few hundred boxes. Forward shipments, although offered at somewhat lower prices, have met with very limited sale. In general, the orders received by jobbers run comparatively light, but are, perhaps, more often repeated. Roofing Plates are growing in demand weekly as the building season advances, and the domestic manufacturers are kept busy in filling orders. Prices for Domestic Plates hold their own in this market.

In regard to the Western Tin Plate trade, our Chicago advices run as follows: "Tin Plate gives some indications of a stiffening in price. Spot lots of Roofing Plates and Coke Tin are very firm on account of the smallness of stocks. The American makers are overwhelmed with work and are running behind on deliveries, while stocks in importers' hands are lighter than ever before known. The stocks of large architects have been completely exhausted, as importers will not keep any quantity of this on hand on account of tariff uncertainties."

A London cable dispatch to *The Iron Age* of April 25, reports that the depression in the British Tin Plate market is more severe after recent improvement. Sellers are yielding slightly to induce business, but make no quotable reduction in prices. Further concessions could not be made without positive loss. There is slightly more inquiry for Canada Plates, and some fair orders have been placed for Oil sizes. Liverpool quotations are as follows:

IC Charcoal, Alloway grade	12/ @ 12/6
IC Bessemer Steel, Coke finish	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/3 @ 10/6

WM. A. STOKES & Co., 30 Warren street, New York, are the general agents of the G. M. Shirk Mfg. Company, manufacturers of the North Star Refrigerators. One of the main features of this construction is a combination of dead air space and granulated cork for insulation, for the purpose of economizing the ice consumption. It is pointed out by the makers that the cork will neither settle down nor absorb moisture, and is an excellent nonconductor.

Chicago Report.

Scrap.—The demand for Old Material grows worse instead of better. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per ℔
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c.	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Dealers are doing very little now, as it is between seasons. They are, however, watching the progress of the miners' strike with much interest, as stocks will be heavily drawn upon if the strike should continue for any length of time. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

ATTENTION is called to the advertisement in this issue of the H. Mueller Mfg. Company of Decatur, Ill. The company are manufacturers of Water and Gas Specialties. Among these are Water Pipe Tapping Machines, which can be used without shutting off the water on the mains or wetting the operator, no matter what the pressure may be. They are described as so easily operated that skilled labor is not necessarily required in making a tap. The Mueller Water Pressure Regulator is another specialty, by the use of which a uniform low pressure can be established in house supply pipes regardless of high or unsteady pressure in the mains. This Regulator is not only useful in preventing the leaking of house boilers by too great a pressure, but it is also valuable in buildings having hydraulic elevators to prevent the breaking of cables and to make elevators run uniformly. The company's line covers Corporation Stop Cocks, brass Water Connections, brass Soldering Nipples, Round Way Stop and Stop and Waste Cocks, brass Plugs, lead Goose Necks, Check and Waste Hopper Cocks, &c., all their goods being warranted.

CONDITION OF THE

Hardware Trade.

THE VOLUME of business is not as large as last April, and during the month there has not been the increase which was anticipated by some. In view of the general practice of purchasing only such goods as are imperatively required for immediate sale or necessary replenishing of stocks, some merchants are supplying their wants from jobbers rather than from manufacturers to a greater extent than heretofore. At the same time an unusual number of orders for comparatively small quantities are received by manufacturers. In fact, jobbers, manufacturers and commission merchants refer to the number of orders which are received as comparing well with any previous season, while the quantity of goods handled is less than usual. The fact that prices are low has the effect also of still further diminishing the aggregate of business as expressed in dollars and cents. Business on the whole is doubtless in a more healthful condition than for some time, and all kinds of goods are going more evenly into the hands of the trade. Prices show no improvement and in many goods the market is weak. Quotations also from jobbers and manufacturers vary considerably, there being an evident desire on the part of all sellers to obtain such business as is to be had. There continues to be a good deal of cutting of prices on the part of jobbers, some of whom are sending out special quotations to induce orders from houses who have not been purchasing with what they consider sufficient liberality. In this condition of things the judicious purchase of Hardware requires careful attention and constant effort to keep posted as to the changes in price which are occurring. Collections give no ground for complaint.

Advices from Chicago.—Shelf Hardware jobbers report their country trade fair, and even their city business is not as dull as had been anticipated when the building strike begun. The past week, in fact, has seen a slight improvement. Orders are considerably more numerous than they were, but they are for small quantities only, showing that merchants are still buying from hand to mouth. Seasonable goods are not active at present. The Refrigerator trade is slow and is not expected to show much improvement until the advent of warm weather. Manufacturers of Wire Cloth are again talking about a shortage. Jobbers are quoting $1.45, and this price is held quite firmly in view of a probable short supply. The demand for poultry netting is large, and manufacturers are considerably behind in their deliveries on contracts. Jobbers' sales this year are practically double those of last year. This is now the hight of the season for this branch of trade. Steel goods are quiet. Haying Tools are moving much more slowly than last year at this time, when the prospects for a heavy hay crop were so bright. Some improvement is noted in the demand for house furnishing goods, tinners' stock and tinware generally. Mail business is picking up in this line. Heavy Hardware is in a little better demand than last week, but trade is spasmodic, a day of big business being succeeded by two or three dull ones.

Notes on Prices.

Wire Nails.—The demand for Wire Nails continues active and of the same general character that has prevailed for some weeks. Some large orders are

being placed from time to time, but the great bulk of the business is in orders of moderate size. The mills are fully occupied, but are desirous of having their production for some weeks to come covered by orders in hand, and are consequently moving energetically for such business as is in sight. The price of Wire Nails remains as at our last report, 95 cents for carload lots at factory being a representative quotation, but attractive orders can command 90 cents, a price beyond which we do not hear of any sales. Small lots from store in New York are held at $1.15 to $1.25.

Advices from Chicago.—Manufacturers' agents report city trade extremely dull, but orders are coming in for fair quantities from country merchants. The consumption in the country generally appears to keep up very well. The demand is considerably below what manufacturers would like to see, and they are again making more vigorous efforts to sell. Prices are therefore still drooping, and are now down close to $1 Chicago. Jobbers report a smaller demand from stock, and have lowered their prices for small lots to $1.10 to $1.15.

Cut Nails.—There is little change in the Cut Nail market. Prices are still affected to some extent by Western competition, and in parts of the Eastern territory which are accessible to the Western mills the manufacturers are meeting Western prices and departing to a certain extent from the policy which was adopted some time ago to quote only delivered prices in the several markets. The low freight rates which are prevailing are also favoring the Western mills, as they are at present able to place Nails at points which heretofore they have not been able to touch. The price of Nails delivered in New York is 95¢ to $1 base, small lots from store in New York being regularly quoted at $1.10 to $1.15.

Advices from Chicago.—Manufacturers report a moderate trade, which is fully as large as they have reason to expect at this season. Factory prices are still quoted at 95¢ Chicago on 55¢ average. Jobbers quote small lots from stock at $1.05 to $1.10.

Barb Wire.—The demand for Barb Wire continues fair, but prices are uneven and the tone of the market not so strong as a few weeks ago. The market is represented by the following quotations for Four Point Galvanized, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.25 to $2.35, but it is probable that these quotations can be shaded.

Advices from Chicago.—Local manufacturers are still full of work, and in some cases are behind with their deliveries on contracts. Eastern manufacturers, however, seem to have caught up with their orders, as their representatives are soliciting trade in this market and promising prompt delivery. Quotations on factory lots of Galvanized Barb Wire are now about $2.15, Chicago. Jobbers report a much better demand from stock than for Nails, and quote small lots of Galvanized at $2.30 to $2.40.

Wire Cloth.—On account of the depression which has for some time prevailed in all lines of business, less than the usual quantity of Wire Screen Cloth was manufactured for the present season. The demand for this article is now setting in actively on the jobbers, and the manufacturers are receiving supplementary orders from those whose purchases were made a few months ago, and the result is that their stock is becoming very short and promises soon to be exhausted. In this condition of things manufacturers who have the goods on hand are advancing their prices with the prospect of still further advances in the near future. The market is thus quotably stronger owing to the scarcity.

Sheet Zinc.—Matthiessen & Hegeler Zinc Company, La Salle, Ill., since the discount sheet on Sheet Zinc referred to in our last issue have sent out two further changes, each being in the way of reduction. The price continues $4.50 for Sheet Zinc in 600-pound casks, of the thicknesses between Nos. 9 to 15, inclusive, and of the widths between 32 to 46 inches, and of the lengths between 84 to 90 inches. The extras are also unchanged. The discounts announced, under date April 18, are as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	15	15	15	15
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	21	20	19	18

All discounts are computed straight when money accompanies the order. Quantity discount is added to special discount in all cases. If remittance is received within 10 days of date of invoice the cash discount will be only 2 per cent. instead of 3 per cent., and not computed straight. Each order is strictly subject to the quotation of the class to which it belongs.

Glass.—There has been no radical change in the condition of the Glass market during the past week, though prices show an upward tendency. An increase is noticed in the number of factories in operation, which would indicate that manufacturers anticipate an increased demand and remunerative prices. A State organization of Indiana manufacturers has been formed, which has resulted in a stiffening of prices in the gas belt. The New York Window Glass market is represented by the following quotations: Single and double strength Glass in small quantities, 80 and 20 per cent. discount; in 1000-box lots, single, 85 per cent., and double strength Glass, 85 and 5 per cent. discount. Pittsburgh factory quotations are reported as 85 per cent. for single, and 85 and 10 per cent. discount for double strength Glass. New York Plate Glass quotations remain 70 and 10 per cent. discount.

Old Metals.—Business is hardly as good as it was a week ago. Some grades of Scrap Iron are, however, in fairly good demand, but bids are below the views of holders. Trade is consequently checked. Prices are irregular and somewhat weak. The following quotations represent about the ruling rates in New York:

Heavy Copper	℔	lb	7½¢
Light and Tinned Copper	℔	lb	6½¢
Heavy Brass	℔	lb	5½¢
Light Brass	℔	lb	4½¢
Lead	℔	lb	3¢
Tea Lead	℔	lb	2¢
Zinc	℔	lb	2¾¢
No. 1 Pewter	℔	lb	14¢
No. 2 Pewter	℔	lb	7¢
Wrought Scrap Iron, ℔ gross ton		$9.00 @	....
Heavy Cast Scrap, ℔ gross ton		7.00 @	....
Stove Plate Scrap, ℔ gross ton		4.50 @	....
Burnt Iron, ℔ gross ton		3.00 @	3.50

Old Rags, Paper, &c.—There has been a more active demand, and prices for Paper stock and Woolen mill supplies are pretty steadily maintained. Quotations as follows:

No. 1 White Rags	℔	lb	3¼ @	3½¢
No. 2 White Rags	℔	lb	2 @	2¼¢
Mixed Rags	℔	lb		⅜¢
Blues and 3ds	℔	lb	1 @	1¼¢
Hard Sized White Shavings	℔	lb	2¼ @	2½¢
No. 1 White Book Shavings	℔	lb	1¾ @	2 ¢
No. 2 White Book Shavings	℔	lb	1 @	1⅛¢
Light Book Shavings	℔	lb		⅜¢
No. 1 Mixed Shavings	℔	lb	¾ @	1 ¢
No. 2 Mixed Shavings	℔	lb	½ @	⅜¢
No. 1 Printed Books	℔	lb	1 @	1¼¢
Ordinary Mixed Books	℔	lb	⅛ @	⅜¢
Newspapers	℔	lb	2-5 @	½¢
No. 1 Manila Paper	℔	lb	1 @	1⅛¢
No. 2 Manila Paper	℔	lb	⅝ @	⅜¢
Bogus Paper	℔	lb		½¢
Common Paper	℔	lb		⅜¢
Straw Chips	℔	lb		½¢
Binders' Clippings	℔	lb	½ @	⅝¢
Jute Butts	℔	lb	1⅞ @	2 ¢
No. 1 Jute Bagging	℔	lb	1 @	1¼¢
Mixed Bagging	℔	lb	¾ @	1 ¢
No. 2 Bagging	℔	lb	½ @	⅝¢
Hemp Twine	℔	lb	2 @	2¼¢
Manila Rope	℔	lb	2¼ @	2⅜¢
Jute Rope	℔	lb	1½ @	1¾¢
Mixed Rope	℔	lb	¾ @	⅞¢

Old Rubber.—The market for Old Rubber is fairly good. Prices rule about as follows, but are subject to variation and are somewhat irregular:

Car Springs, ton lots, ℔ lb.		@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.		@	.03½
Rubber shoes, less than carloads, ℔ lb		@	.03¼
Large Hose, ℔ ton		@	12.00
White Wringer Rolls, ℔ lb.		@	.03¾
White Syringes, ℔ lb		@	.03¾

Trade Notes.

AN UNUSUALLY striking announcement is made elsewhere in this issue by the Perfection Furnace Pipe Company, Broadway and Logan street, Toledo, Ohio. In the two-page display they show a large number of goods that are of interest to the trade, and those who have use for such articles are invited to send to the company for their catalogue and price-list.

THE ANNOUNCEMENT elsewhere of N. & G. Taylor Company, Philadelphia, Pa., relates to Columbia guaranteed Terne Plate, which is described as a high grade, heavily coated Terne Plate, made from the finest quality of rehammered Siemens-Martin soft steel. The sheets are resquared and stamped.

THE CONTRACT for all the Steel and Iron Work for the new Pulaski County jail, at Dublin, Va., was recently awarded to E. T. Barnum, Detroit, Mich.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, make an interesting announcement in their advertisement in this issue.

Occupying part of their space is a coupon which will be received by them as the equivalent of $1 in payment for a first order of Furnace Stacks or Fittings amounting to $10 or more. The company manufacture all kinds of fittings, and are prepared to fill orders as soon as received.

Among recently chartered corporations in New York State is the Glazier Headlight Company of Rochester, N. Y., to manufacture Headlights, Lanterns, and Sheet Metal Goods. The directors are: Elias C. Glazier, Nellie A. Glazier, Frank P. Siddons, and others of New York City. Capital $6000.

The building now under erection by the Canton Rolling Mill Company, Canton, Ohio, is rapidly approaching completion, and is expected to be finished about July 1 next. The new concern will engage in the manufacture of Iron and Steel Sheets and expect to turn out from 25 to 35 tons per day. The building is of iron and is being erected by the Canton Bridge Company of Canton, Ohio. The rolls are being furnished by the Lloyd Booth Company of Youngstown, while Wm. Tod & Co. of the same place will supply the engine, and Reeves Brothers of Alliance, Ohio, have the contract for the boilers.

The Chester Pipe & Tube Company, Chester, Pa., give notice of a proposed increase in their capital stock. It is said that this action has been in contemplation for over a year, and that advantage will now be taken of the very low prices of materials to make the improvements which the management has had in mind.

The American Sheet Iron Works, Philipsburg, N. J., were again shut down this week for lack of orders.

The McDaniel & Harvey Com pany's mills, at Wilmington, Del., and at North East, Md., are running full on orders for Sheet Iron.

Cost of Melting.*

There is probably less known about the actual cost of melting iron in cupolas for foundry work than about any other branch of the foundry business. But few foundrymen make any attempt at keeping a cupola or melting account. Many of those who do, keep it in such a way that they not only fail to learn the cost of melting, but are misled by the account to suppose their melting costs them a great deal less per ton than it really does. In the majority of foundries the melting is left entirely in the hands of the melter, who as a rule has no system for doing the work, and has no control over his assistants or interest in having them do a fair day's work. In many of the foundries I visit twice the number of men are employed as cupolamen as are employed in melting the same amount of iron in other foundries, where the facilities for handling the stock are almost the same, and the expense of lining and daubing material is frequently double with one melter what it is with another in the same sized cupola with the same sized heats.

In many foundries the fuel is not weighed, but is measured in baskets, or the number of shovels counted and the weight estimated. When the fuel is measured in baskets the baskets always stretch and enlarge, and an old basket frequently holds one third more than a new one; from 10 to 20 pounds more can easily be piled on the top of a basket after it is filled. Foundrymen who charge their fuel by the basket always use more fuel than they estimate they are using; when the shovels are counted, each shovel may be made to weigh more than is estimated, and a few extra shovelfuls are always thrown in, for fear some were not full. When too much fuel is used in a cupola there is not only a wastage of fuel, but there is slow melting, increased destruction of the lining and an increased wear and tear of the blast machinery. For these reasons every pound of fuel that goes into the cupola should be accurately weighed. Even when the fuel is supposed to be accurately weighed there should be some check on the melter, for he will shovel in extra fuel if not watched.

At a foundry I recently visited in New Jersey an accurate account of the melting had been kept for a year. At the end of the year the president of the company had figured up the amount of fuel consumed in the cupola and compared it with the amount purchased, and found they were short 260 tons. At another foundry, where the melter always reported melting 7 pounds of iron to 1 pound of anthracite coal, they ran short 300 tons in a year. This kind of work should be prevented by checking up the melter's report and comparing it with each carload of fuel consumed.

A cupola book should be provided, with blank spaces for recording the weight of coal or coke in the bed and charges, and the weight of each brand of iron, No. 1, 2 or 3 and scrap, showing the exact mixture of each charge and heat. A note should also be made of the quality of iron produced from the mixture. Such a record is of great value in making mixtures and charging a cupola, if it is properly kept.

The cost of melting per ton is figured in a number of different ways, but to be of any practical value the entire cost of melting should be figured on as follows:

Interest on cost of cupola plant and depreciation in value of same.

Fire brick for relining and repairs.

Fire clay, loam and sand for cupola and ladles.

Repairs to cupola, blast pipe, elevator, scaffold, runway, blower, &c.

Belts, oil, &c., for blower.

One-fourth the entire cost of engine.

Tools, wheelbarrows, buckets, hose, shovels, forks, rakes, hoes, sledges, picks, bars, trowels, bod sticks, tap bars, &c.

Wood for lighting up and dredging ladles.

Coal or coke consumed in melting.

Labor employed in removing the dump, making up cupola, milling dump and gates, collecting gates, scrap and bad casting from foundry, placing iron and fuel on scaffold, charging, breaking and piling iron in yard, breaking up bad castings, daubing ladles, &c.

When the cost of all these items has been learned, and the amount divided by the number of tons melted, it will be found that the cost of melting is about $2 per net ton of iron in the ladles. In foundries with all the modern improvements for handling the stock the cost is a little less than $2 per ton, and in foundries with none of the improvements for handling the stock and no system in melting the cost per ton is as high as $3. When there is doubt as to the accuracy of weights in charging, the weights should be compared with the fuel purchased and castings sold, and the cost of melting may be figured on the weight of castings sold in the place of the amount of iron melted. To make a cupola report of value the fuel, labor and tool accounts should be kept separate, and an effort made to reduce the expense of each account.

* Paper by Dr. Edward Kirk, read at the last monthly meeting of the Western Foundrymen's Association.

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Metal and Miscellaneous Prices.

CHICAGO, APRIL 26, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.65 @$5.75
IC, 14x20. 90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal, extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Palm, IC, 20 x 28	@$11.25
Palm, IX, 20 x 28	@ 14.00
Empire, IC, 20 x 28	@12.00
Empire, IX, 20 x 28	@15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 15.00
" IX, 20 x 28	@ 18 00
Merchant's Roofing (extra coated), IC, 20 x 28	@$17.25
Merchant's Roofing (extra coated), IX, 20 x 28	@$21
Merchant's Old Metbod (extra heavily coated), IC, 20 x 28	@$18.75
Merchant's Old Method (extra heavily coated), IX, 20 x 28	$22.60
Westmoreland: IC, 14 x 20	$6.00
IC, 20 x 28	12.00
Elwood: IC, 20 x 28	$11 50
Furmston: IC, 20 x 28	$11.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process: IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style: IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers.....13¢ net.

Patent Planished.....℔ A, 10½¢; B, 9½¢

dis. 5%

Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75%

Copper—

Ingot.

Lake.....10½¢ @ 11¢

Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.) (To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.34
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....5

Sheet Zinc—

600 ℔ casks.....50¢

300 ℔ casks.....4.70¢

Loose sheets.....4.80¢

Lead—

Soft Pig Lead.....4 ¢

Bar.....4½¢

Pipe.....5½¢, dis. 10¢

Block Tin Pipe.....35¢

Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢

Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢

Hallett's.....12¢

Wrought-Iron Pipe—

1¼ and under, Plain	60&10%
1¼ and under, Galv	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv	60&10%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Disconnt from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles: Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ ℔, 2 ¢
" " Brown	℔ ℔, 1½¢
" " Purple	℔ ℔, 2½¢
" Ground in oil, B. Red	℔ ℔, 6½¢
" Ground in oil, Red	℔ ℔, 6½¢
" Ground in oil, Brown	℔ ℔, 5½¢
" Ground in oil, Purple	℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	52¢
Linseed Oil, Raw, in bbls	49¢
Mineral Paints	2@4¢
Orange Mineral	9¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	84¢
Spirits Turpentine, in bbls., ℔ gal	34½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.75
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, APRIL 27, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	℔ ℔, 75¢
100-℔ lots	℔ ℔, 73¢
Ton lots	℔ ℔, 70¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	℔ ℔, 70¢
100-℔ lots	℔ ℔, 65¢
Ton lots	℔ ℔, 60¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	℔ ℔, 65¢
100-℔ lots	℔ ℔, 60¢
Ton lots	℔ ℔, 55¢

Antimony—

Cookson.....℔ ℔, 10¾¢

Hallett's.....℔ ℔, 9¾¢

Brass—

Planished.....net

Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¾-in. up to 2-in	$0.35
⅝-in. up to ¾-in	.36
½-in. up to ⅝ in	.38
⅜-in. up to ½-in	.41
5-16-in. up to ⅜ in	.48
¼-in. up to 5-16-in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 16, inclusive,	.38

25 @ 30%

Copper and Bronze Tubing—

8¢ ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*

Galvanized.....60%

Galvanized, Locked Joints.....60%

Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats...19¢ ℔ ℔, net

Ingot.

Lake.....10½¢

Ansonia Grade Arizona.....10 ¢

Ansonia Grade Casting.....9¼¢

Planished.....net

Sheet and Bolt.....15¢ ℔ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%

Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%

Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz. 20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%

Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%

Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.50	2.80¢
Nos. 17 to 21	℔ ℔. 2.60	2.90¢
Nos. 22 to 24	℔ ℔, 2.70	3.00¢
Nos. 25 and 26	℔ ℔. 2.80	3.10¢
No. 27	℔ ℔. 2.90	3.20¢
No. 28	℔ ℔, 2.95	3.30¢
American B. B.	℔ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11½@12½¢

Patent Planished.....℔ ℔, A, 10¢; B, 9¢, 5%

Craig Polished Sheet Steel.....℔ ℔ 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@75&10%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3¾¢@4¢

Bar.....4½¢

Pipe.....5¾¢, 20%

Tin Lined Pipe.....15¢, 20%

Block Tin Pipe.....37½¢, 20%

Sheet.....6¾¢, 20%

Old Lead in exchange, 2¾¢ ℔ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil: Raw, ℔ gal	@ .40
Boiled	@ .43
Spirits Turpentine: In bbls	@ .32
Putty: In barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01⅝ @ .01⅝
In tin cans	.01¾ @ .02¼
In bladders	.01⅞ @ .02¼

Roofing Material, &c.:

Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔ ℔	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra.	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₩ bbl. $1.23@$1.24
Rosin, E. & F.....₩ bbl. $1.35@$1.55
Rosin, G. & H.....₩ bbl. $1.75@$2.10
Rosin, I. & K.....₩ bbl. $2.35@$2.60
Rosin, M. & N.....₩ bbl $2.80@$2.95

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.50@ 4.25
Peach Bottom, ₩ sqr.....5.00@ 6.25
No. 1 Chapman, ₩ sqr.....4.00@ 4.65
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.70@ 3.20
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼.....13½@14¢
No. 1.....11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg. } 5% dis.
Kegs, about 55 lb, ₩ lb.....4¢

Yager's Soldering Salts.
¼-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb.....21¾¢
Straits, pigs, ₩ lb.....21¢ @ 21¼¢
Straits in bars, ₩ lb.....22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20.....6.12
" IX, 14 x 20.....6.38
Apollo Roofing, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Atlantic, IC, 14 x 20.....5.75
Bonus, Extra Coated, IC, 14 x 20...6.75
" " " IX, 14 x 20....8.25
Buckeye, IC, 14 x 20.....7.00
" IX, 14 x 20.....8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20.....5.37½
Climax, IC, 14 x 20.....5.50
Columbia, IC, 14 x 20.....7.00
Dane, IC, 14 x 20.....5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20.....5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28.....15.00
Empire, IC, 14 x 20.....5.75
Extra Central, IC, 14 x 20.....5.62½
Flag, IC, 14 x 20.....5.25
Fort Pitt, IC, 20 x 28.....11.00
Globe, IC, 14 x 20.....5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20.....5.75
Kensington, IC, 14 x 20.....6.75
" IX, 14 x 20.....8.00
Knoxall, IC, 14 x 20.....6.00
Laufman's Apollo (Resquared), IC, 14 x 20.....8.12
Laufman's Apollo (Resquared), IX, 14 x 20.....9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20.....6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20.....7.00
Maple, IC, 14 x 20.....6.50
Merchant's Roofing (Resquared), IC, 14 x 20.....8.25
McKinley, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Newcastle Real Old Method, IC, 14x20 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.25
N. F. Old Style, IC, 14 x 20.....7.50
" " IX, 14 x 20.....9.00
Old Colony, IC, 14 x 20.....8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20.....5.25
Palacio, IC, 14 x 20.....5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20.....8.00
Phœnix, IC, 14 x 20.....5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20.....9.25
Scott's Extra Coated (Resquared), IX, 14 x 20.....10.75
Taylor Old Style (Resquared), IC, 14 x 20.....9.25
Taylor Roofing, IC, 14 x 20.....8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20.....6.10
U. S. Redipped, IC, 14 x 20.....8.25
Venus, IC, 14 x 20.....5.37½
Vigilant, IC, 14 x 20.....5.50
Waldo Redipped, IC, 14 x 20.....6.75
Westmoreland, IC, 14 x 20.....6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20.....6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....6.75
Hazel, IC, 14x20.....5.80
Iowa, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Linden, IC, 14x20.....6.50
Merchant's Dipped, IC, 14x20.....11.00
Merion, IC, 14x20.....6.75
Mint, IC, 14x20.....6.00
Newcastle Russia, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
Newcastle Juniati, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.50
Newcastle Best Coke, IC, 14 x 20.....6.00
" " IX, 14 x 20.....7.25
Newcastle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.75
Palma Xtra, IC, 14x20.....7.25
Phœnix, IC, 14x20.....6.25
" IX, 14x20.....7.75
Royal, Extra, IC, 14x20.....7.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Youghiogheny, IC, 14 x 20.....6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$7.50
20 x 28.....15.00
IX, 14 x 20.....8.75
20 x 28.....17.50
Pontymister Grade, IC, 14 x 20.....6.50
20 x 28.....13.00
IX, 14 x 20.....7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20.....5.75
20 x 28.....11.50
IX, 14 x 20.....6.75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....$5.37½
20 x 28.....10.70
IX, 14 x 20.....6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20.....5.25
20 x 28.....10.50
IX, 14 x 20.....6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ lb.
Melyn and Calland Grade. IC, 10 x 14.....$6.37½
" " IC, 12 x 12.....6.62½
" " IC, 14 x 20.....6.37½
" " IC, 20 x 28.....12.75
" " IX, 10 x 14.....8.00
" " IX, 12 x 12.....8.25
" " IX, 14 x 20.....8.00
" " IX, 20 x 28.....17.00
" " DC, 12½ x 17.....6.00
" " DX, 12½ x 17.....8.00
Allaway Grade. IC, 10 x 14.....5.75
" " IC, 12 x 12.....5.87½
" " IC, 14 x 20.....5.75
" " IC, 20 x 28.....11.50
" " IX, 10 x 14.....7.00
" " IX, 12 x 12.....7.25
" " IX, 14 x 20.....7.00
" " IX, 20 x 28.....14.00
" " DC, 12½ x 17.....5.50
" " DX, 12½ x 17.....6.50
Coke.
Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20.....8.12½
20x28.....11.00
IX, 10x14, 14x20.....6.60
B. V. Grade.—IC, 10x14, 14x20.....5.40

Imported Boiler Plates—

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets).....14.50
IXX, 14x31..(112 sheets).....16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.,...18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....52½&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 lb casks.....₩ lb 4½¢
Per lb.....5¢.@ 5¼¢

It Is Reported—

Colorado.

That the copartnership heretofore existing between E. Harris Jewett and C. A. Crane, under the name and style of the Midland Hardware Company, COLORADO CITY, has been dissolved by mutual consent, Mr. Crane retiring. The business will for the present be continued by Mr. Jewett alone.

That C. E. Day's Hardware store, at DENVER, was robbed of a quantity of Cutlery on the 7th inst.

Illinois.

That John Nickle, ALGONQUIN, has sold his stock of Hardware to a Hampshire concern.

That burglars broke open the safe of Titsworth & Powell, Hardware merchants of AURORA, on the night of the 17th inst., and secured $50 in cash; $200 worth of goods were also stolen.

That the Hardware store of Keller & Co., EDWARDSVILLE, was burglarized on the 9th inst.

That Knapp & Schock, PEARL CITY, the new Hardware firm, are now ready for business at Yeager & Son's old stand.

That F. M. Clark has bought a Hardware store at CAMP POINT.

Indiana.

That the Hardware store of J. S. Bowers & Co., DECATUR, was burglarized on the 17th inst., and about $65 worth of goods taken away.

That Kaufman E. Funk has purchased the remaining stock of Hardware of Keen Bros. & Krupp, ELKHART, and will continue the business at the old stand.

That W. W. Foulke & Co., RICHMOND, who have been identified with the Hardware business for many years, have closed out, Mr. Foulke retiring. The stock has been purchased by the Jones Hardware Company.

Iowa.

That L. Farnham has bought the Hardware and grocery stock of C. Dean, ROCKFORD.

That Peter F. Klein of CALMAR has bought a half interest in a Hardware store at VOLGA CITY, Clayton County.

That Alexander Weir has disposed of his Hardware business at MONTEZUMA to A. A. Brown of STUART.

That C. L. Becker's Hardware store at KEOKUK was robbed on the 10th inst.

Kansas.

That W. W. Work has traded his residence and business in ERIE for J. M. French's $14,000 stock of Hardware at TOPEKA.

Michigan.

That F. H. Darrow of TEKONSHA has added a stock of Hardware to his tin business.

That the entire stock of the Muskegon Hardware Company of MUSKEGON has been transferred by C. H. Hackley and the Geo. Selkirk estate to John H. Banninga and Frank Alberts.

That the interest of Mr. Pettit, recently deceased, in the Hardware firm of Pettit & Minnie, EATON RAPIDS, has been purchased by Merton P. Bromeling, who will discontinue his business recently started at Onondaga and remove the stock to EATON RAPIDS.

That fire destroyed the Hardware store of H. Soames, MAYVILLE, on the 13th inst.

Minnesota.

That E. H. Dunton of Ludden, N. D., has traded his stock of Hardware for that of the Annandale Hardware Company of ANNANDALE.

That the Hardware store of Tennis & Plummer, PARK RAPIDS, was entered by burglars on the 12th inst. and some Shot Guns stolen.

That the Hardware store of Alderman, Sylvester & Eiseth, CROOKSTON, was damaged by fire on the 15th inst. The loss on building and stock was about $1600, fully insured.

That Wood & Co., Hardware dealers at ST. LOUIS PARK, have removed their stock to PINE CITY.

That D. Shutt has bought a half interest in G. J. Dunford's Hardware business at CANTON.

That R. A. Ferris of GRENADA has completed a deal with T. G. Tomlin for his half interest in the Hardware business of Tomlin & Fields, at LAKEFIELD.

That the Hoppin Hardware Company, DEXTER, have commenced the erection of a large brick building which they will occupy on completion.

Missouri.

That the Hynson Hardware Company of ST. LOUIS have filed articles increasing their capital stock from $15,000 to $30,000. The assets of the concern are given as $30,000 and the liabilities as $16,632.15.

Nebraska.

That sneak thieves broke into the Hardware store of George Scheidel, PLATTE CENTER, on the 9th inst. and carried off about $200 worth of goods.

That burglars on the 9th inst. forced open a window in the Hardware store of Furlong & Eustice, AUBURN, and got away with $50 worth of Revolvers and Cutlery.

New York.

That Charles Taylor has purchased his father's Hardware business at ADDISON.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

At once, a first-class sanitary PLUMBER, STEAM and HOT WATER HEATER; state experience and wages expected. W. H. Stoyle, Huntington, L. I., N. Y. Apr. 28

A practical TINSMITH who thoroughly understands inside and outside work and general jobbing, and who has a good knowledge of plumbing; steady job to the right man; must be temperate; state experience, age, weight, wages expected, married or single. P. O. Box 80, Warren, Mass. Apr. 28

A SUPERINTENDENT for stove foundry; must be a practical mechanic and well up in figures; none need apply that has not push and energy. "Practical," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

A BRASS FINISHER; one that understands spinning and brazing preferred. "L.," Box 428, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

A SALESMAN to travel in New England on commission for a light manufacturing concern. Prondman Bros., 108 Miller street, Meriden, Conn. Apr. 28

At once, a good TINSMITH for a country shop; must be sober and willing to do a good day's work without a boss standing over him. Silsby & Sargent, Sumapee, N. H. Apr. 28

A competent person to take charge of the polishing and buffing room of a large brass finishing establishment; must be familiar with iron work also; first-class references required. "Brass Worker," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

At once, an A1 PLUMBER and TINSMITH; one that can wipe a joint and do hot water fitting; to the right man a steady job, &c., year round and good wages; must be temperate and steady; give references and wages expected. P. E. Fraleigh, Red Hook, N. Y. Apr. 21

A few good reliable persons to work the retail stove trade in the cities of Baltimore, Washington, D. C., New York, Brooklyn, Syracuse, Rochester and Buffalo, N. Y., Richmond, Va., Wilmington, Del., Boston, Nashville and Memphis, Tenn., St. Louis. Geo. R. Moon, 561 Short avenue, Columbus, Ohio. Apr. 21

SALESMAN visiting the hardware and stove trade in Michigan, Indiana, Illinois or Iowa, to sell a first-class and ready selling line of house furnishing goods on commission; experienced salesman with established trade in territory only need apply. "Stove Trade," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Apr. 21

At once, good all round TINSMITH with some knowledge of plumbing; to steady, industrious man a steady job will be given; state wages expected, experience, and give name of last employer. E. A. Burbank, Berlin, N. H. Apr. 21

SITUATIONS WANTED.

As PLUMBER or ASSISTANT plumber; a steady position; regular habits and willing to work; recently graduated from the plumbing department of the New York Trade School. "C. J. O. H.," 391 Bridge street, Brooklyn, N. Y. Apr. 28

SALESMAN with trade in the furnace and range business in New York City and New England is open for engagement; reference. "D. L. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

A SHEET IRON and TIN WORKER; No. 1 mechanic at all kinds of work—heating, ventilating, railroad, ship, mines, cornices, jobbing and assortment; would like a job in good shop; sober and reliable; will go to any part of any country required; steady job at moderate pay. "Guarantee," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

By a first-class PLUMBER in all branches of the trade; city or country. "R. K.," 167 Avenue A, New York City. Apr. 28

In some mill or factory where an active man of middle age can bring his knowledge of mechanical drafting and general machinery to some use; best of references; moderate salary. Geo. H. Ball, 1318 Pine street, Philadelphia, Pa. Apr. 28

Practical PLUMBER and STEAM FITTER would like to learn from parties wishing to add or develop plumbing and heating business; can make plans and estimates for the several branches of the trade; will work by the day or on commission; can furnish complete set of plumbing and tinning tools. Box 244, Harrimau, Tenn. Apr. 25

By a practical CORNICE and SKYLIGHT WORKER, also RAISER, 12 years' experience in this country. John Weier, 1378 Avenue A, New York City. Apr. 28

A young man, 19 years of age, would like to get a chance to learn the plumbing trade; has worked nearly a year in a country shop as helper at general jobbing; a good chance the main object; best of references as to character and honesty. J. E. Bump, Farmington, Maine. Apr. 28

By a first-class TIN and SHEET IRON WORKER on in and outside work; understands working from plans; steady work desired. L. Goldstein, 113 East Houston street, New York City. Apr. 28

A first-class FITTER desires work in a country town; will guarantee to give satisfaction; steady; can do galvanized iron pipe fitting. "G. R.," 189 First avenue, New York City. Apr. 28

As CORNICE MAKER by an experienced workman; works from detail. Bernard Winter, 239 Second street, New York City. Apr. 28

By a good TINSMITH: accustomed to all kind of work; willing and obliging; city or country; moderate salary. H. Cohen, care of Marcuze, 117 Broome street, New York City. Apr. 28

By a TINNER, 23 years of age, with five years' experience in shop work, roofing, spouting and general jobbing; strictly temperate; country preferred: first-class reference. Henry Bailey, Tully, N. Y. Apr. 28

By an ELECTROPLATER of 30 years' experience upon work of every description with all solutions; also polishing, buffing and fancy coloring and oxide work, hand and lathe burnishing. "Electroplater," 18 Schaefer street, Cleveland, Ohio. Apr. 28

By a foundry foreman, as FOREMAN or MOLDER in an iron or brass foundry; have held similar position; capable of handling a good number of men; well acquainted with engineering, machinery and the building trade; general jobbing; good references; temperate. Thomas Wathen, Box 33, Walden, N. Y. Apr. 28

By a BRASS FINISHER; eight years' experience. A steady, sober young man wants a steady situation. Geo. Faris, 524 Morris street, Philadelphia, Pa. Apr. 28

By a good TIN, SHEET IRON, SKYLIGHT and CORNICE MAKER; reliable; city or country. H. Shipman, 401 South Fourth street, Brooklyn, E. D., N. Y. Apr, 28

By a first-class TIN and SHEET IRON, CORNICE and SKYLIGHT WORKER; 15 years' experience; 25 years of age; steady job desired at inside or outside work; city or country. H. Dobkin, 30 Orchard street, New York City. Apr. 28

First-class STEAM and HOT WATER FITTER with 20 years' experience and good references wants a situation in San Francisco or in any city south of that in Californuia; hot water fitting preferred. "Steam Fitter," 207 Collette street, Danville, Ill. Apr. 28

As TINNER or CLERK; eight years' experience in general hardware, stoves and house furnishing goods; active, temperate, good bookkeeper; can do any shop work required; moderate terms; references. "J. O. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

By a TINSMITH, ROOFER and GENERAL JOBBER; understands range and furnace work; wages moderate. "J. B.," 109 Amsterdam avenue, New York City. Apr. 28

By a good TINSMITH and CORNICE MAKER, 30 years of age, German; can do his own cutting; some knowledge of iron pipe work; 15 years' experience; city or country. "C. B.," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

By a young married man with ten years' experience at tinning, plumbing, steam and hot water fitting and general jobbing; steady position by the year desired at fair wages. "Nelson," office of *The Metal Worker*, 96-102 Reade street, New York. Apr. 28

By a first-class PLUMBER; country preferred. Patrick Dervin, 147 Amsterdam avenue, New York City. Apr. 28

Young man with knowledge of retail and thoroughly experienced in the wholesale hardware business, four years with the largest firm of its kind in the West, desires a position, SALESMAN preferred; or to act as a manufacturer's agent in Chicago or other large Western city; unquestionable references. "Box 32," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. Apr. 28

By a practical STOVE FOUNDRYMAN with 15 years' experience as general foreman and foundry manager; can furnish first-class references as to ability in handling large numbers of men to good advantage; will take a position at a reasonable salary. O. D. Casterline, 222 Dayton, Ohio. Apr. 28

By a PLUMBER and GAS FITTER; city or country; wages $2.75 per day. Albert Dorer, 491 Tenth avenue, New York City. Apr. 28

A first-class mechanic would like to engage with a firm as FOREMAN; thoroughly understand the management of shops doing tin, sheet iron and plumbing work, house heating by steam, hot water and hot air; have had a long and practical experience laying out and superintending work from architects' plans; good business ability, strictly temperate and reliable. "J. P. L. No. 1," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

By a practical TINSMITH, TIN and SHEET IRON WORKER and ROOFER; understands all kinds of inside and outside work and general jobbing; 18 years' experience; city or country. N. Gold, 92 Essex street, New York City. Apr. 28

As side line with tin plate and metals, a good line of stoves, or plumbing and gas fitting goods; salary or commission; good reference. A. S. Caldwell, 59 East Fifth street, Cincinnati, Ohio. Apr. 28

By a PLUMBER, 26 years of age; eight years' experience at plumbing and gas fitting; steady and temperate; can furnish first-class references; not particular as to location. T. J. Hanley, 2218 Dearborn street, Chicago, Ill. Apr. 28

As STEEL RANGE MAKER and MOUNTER; 15 years' experience; can make complete line of steel cooking apparatus. "Wrought Steel," 330 Fort street, West, Detroit, Mich. Apr. 28

First-class PLUMBER wants steady work; city or country. John T. Pratt, 630 Third avenue, New York City. Apr. 28

By a PRACTICAL MECHANIC at spinning and pressing tin and sheet iron; capable of taking charge of a large establishment; understands making tools; has a milk can patent to dispose of; 16 years' experience. E. Plucom, 863 Park avenue, Brooklyn, N. Y. Apr. 28

A young man, 27 years of age, with 12 years' experience at tin and sheet iron work, roofing, cornice, furnace work, all kinds of general jobbing, stoves, ranges and heaters; speaks English and German. John Smith, care of Finck, 604 East Ninth street, New York City. Apr. 21.

As FOREMAN of iron foundry, by a thorough practical foundryman with six years' experience as foreman; can handle men and material in an economical manner. "H. J.," No. 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

By SHEET IRON SALESMAN; controls large Eastern trade on galvanized and black sheets. "B. B.," Box 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

A gentleman well posted in the requirements of the plumbing trade desires a position as manager or general agent to represent a first-class house manufacturing fine sanitary specialties; have had 23 years' experience in the manufacture of this line of goods, and can furnish considerable business to desirable parties. "Specialties," No. 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

By experienced mechanic as SUPERINTENDENT of manufactory making locks and builders' hardware a specialty; 15 years' experience as superintendent; understands the business in all its branches; can handle men and material economically. "M. C.," No. 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

Buyer's position by high class man; must be with large concern; export or otherwise. "H. & L.," No. 419, office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 21

By a young man, 21 years of age, as SALESMAN in any line of business; two years' experience in stove business; can furnish excellent references. Chas. Frauk, care of General Delivery, P. O., New York City. Apr. 21

By a first-class PLUMBER; seven years' experience; good references. Lock Box D, Haverhill, Mass. Apr. 21

By a man with ten years' experience in TIN and SHEET IRON WORK; thoroughly understand heating by steam, hot water and hot air; can lay out, estimate and do work from architect's plans; strictly temperate and reliable. J. P. Lisk, 636 Monroe street, Brooklyn, N. Y. Apr. 21

By an experienced TINSMITH, good jobber, steady work desired. E. Gold, 62 Boerum street, Booklyn, N. Y. Apr. 21

Steady position desired by a first-class STOVE PATTERN FITTER; 18 years' experience; best of references. Tony Schafer, 629 Rigdon street, Hamiltou, Ohio. Apr. 21

Special Notices.

WANTED, TO BUY PRESSES

Good second-hand Drawing and Punching Press for drawing metals. Address, giving full particulars, to

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FOR SALE CHEAP.

Wood and iron patterns for two sizes of laundry stoves each with round and oval tops. Also iron patterns, with flasks, for three sizes cheap self-feeder, with and without T. K. attachment. Address

J. H. CORT & SON,
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One Screw Press for stamping sheet metal. Must be in first-class order. Please state price.

F. SABIN,
146 N. Second Street, Phila., Pa.

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One 30-inch Squaring Shears. In fair condition. Must be cheap.

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Small foot-power Iron Lathe. Cash or will exchange second-hand tinners' machines.

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NOTICE OF ASSIGNMENT.

Notice is hereby given that John B. Fisk of the Borough of Hightstown, in the County of Mercer, State of New Jersey, has this day made an assignment to the subscriber, of his estate, for the equal benefit of his creditors, and that the said creditors must exhibit their respective claims under oath or affirmation, to the subscriber at his store, on Main street, in said borough.

ELWOOD ELDRIDGE, Assignee.
Dated March 19th, A. D. 1894.

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An enameler of 30 years' experience, about retiring, offers for sale his own and some of the best American and English receipts for enameling. All good and tested. Apply in first place to "GLASS," office of *The Metal Worker*, 96-102 Reade St., N. Y.

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GALVANIZED IRON CORNICE WORKS with or without real estate. Established over 17 years. Owner wishes to retire from active business. Address or apply to

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Will buy a lot with iron tanks. Any size. Must be cheap for spot cash.

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One No. 5 Sturtevant Fan and Counter Shaft, with 38 feet of 11½-inch Galvanized Iron Blow Pipe. Address

WESTERN STOVE MFG. CO.,
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E. B. STOCKING, Attorney at Law.
611 F ST., N. W., WASHINGTON, D. C.

ESTABLISHED 1853.

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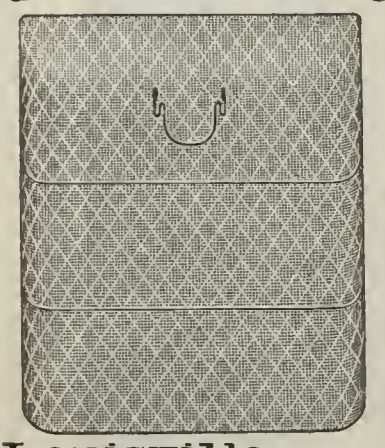
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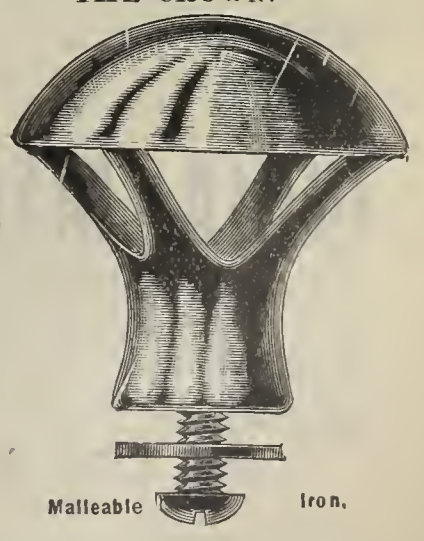
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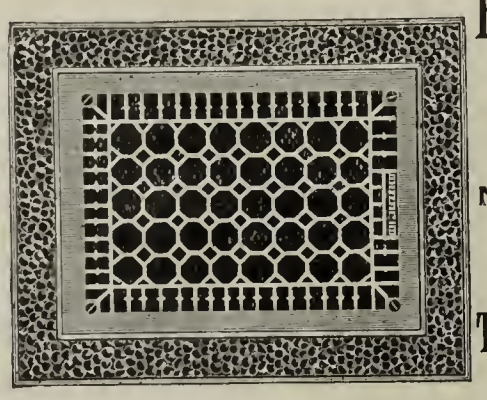
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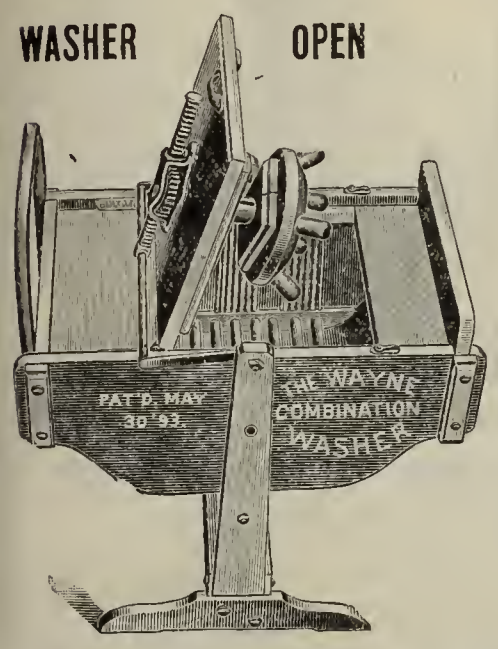
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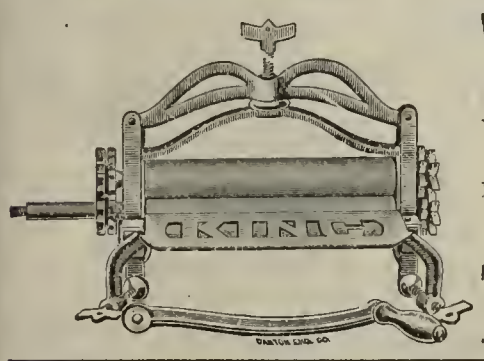
One-third easier than any other machine, takes less water, is the simplest and in all is warranted the best washer of the large family of washers now on the market.

No Dealer Should be Without it.

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We also make all other brands of Wood and Iron Frame Wringers.

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Is the Latest and Best Flour Sifter on the Market.

SOME OF ITS ADVANTAGES ARE:

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It is done with a natural motion of the hand.
It has a cover and does not scatter the flour.
It has an agitator that will not grind foreign substances through the wire netting.

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Manufactured by the

CLIMAX MANUFACTURING COMPANY,

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SHOULD BE USED ON EVERY

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as they hold the heat back, retaining it just where it is wanted, with no smoke or gas in the room, saving 25 per cent in fuel.

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Have you seen the No. 1 Pattern? If you haven't you want a sample. It's positively the best and only washer that your customers will like and not discard after a short time as they do with others.

BOSS WASHING MACHINE CO.,

Cincinnati, O.

Lilienthal Flying Machine

Prof. Du Bois Reymond, at a recent meeting of the Physical Society of Berlin, as quoted by the London *Globe*, referred to the experiments of Dr. Lilienthal in flying, and declared that it would be possible to fly even when the wind was unfavorable by combining good steering with soaring in the manner of Lilienthal. The problem depended, he said, on the correct utilization of the wind, the correct shape of the supporting surfaces, and the correct handling of the apparatus. Soaring is only possible when the pressure of the wind has a vertical component, that is to say, an upward element or impulse.

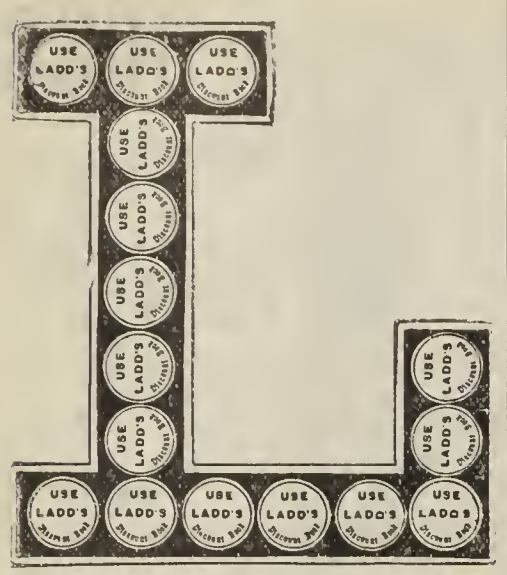
Experiment shows, he maintained, that kites and other surfaces can acquire a horizontal motion when their curvature has a certain mathematical relationship to their superficies, or extent of surface, and this relation is observed in the wings of birds. Dr. Lilienthal's flying machine consists of a surface of 14 sq. m., curved after the manner of birds' wings. It is made by stretching linen over a light wooden frame, and weighs 20 kg. In the middle there is an aperture for the body and the apparatus is kept in position by the wearer's arms. On running rapidly down a hill against the wind the wearer soon gets the benefit of the vertical component of the wind's force, and can sail through the air. Dr. Lilienthal has covered about 400 feet at a hight of nearly 100 feet in about a minute. Dr. Du Bois Reymond, aged as he is, has taken leaps of nearly 100 feet through the air with the same means.

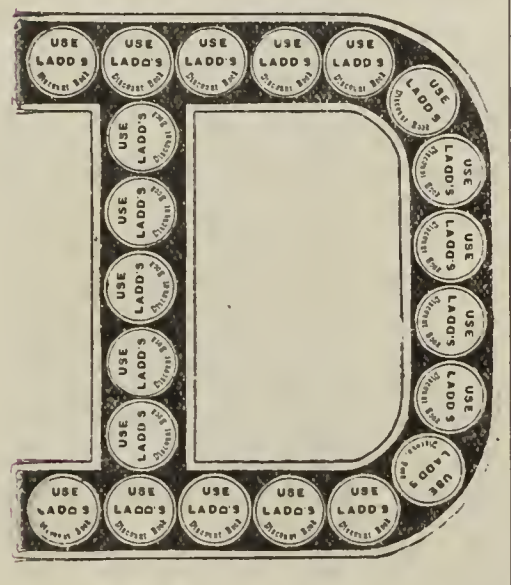
— CORA VAN SULLEIGH: "Although Kate Hunterman is not married to Jack Singleton yet his nephews and nieces already call her aunty."

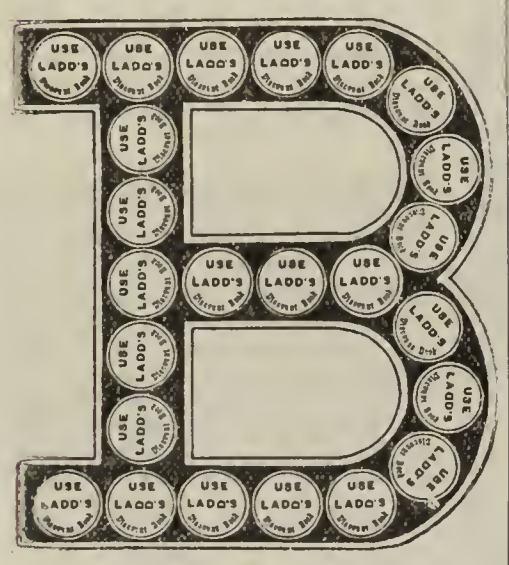
Clara Maliss: "As she's been after him for some years I hardly see why they should call her ante." — *Raymond's Monthly.*

— A KIND SON.—"That's rather a dandy coat you've got on, Tibbets. You seem to be putting on style."

"It is rather nobby, that's a fact. I gave my son the price of a suit of clothes this morning, and he let me have this coat, as he'd got through wearing it."







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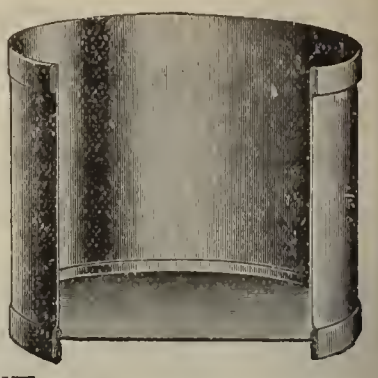
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Nested or packed in single sizes

This measure is without doubt the best article of the kind on the market. The bottom is fastened mechanically in the slot formed by the peculiar method of folding the bottom, which is clearly shown in the cut above. It is further strengthened by the band folded at the top.

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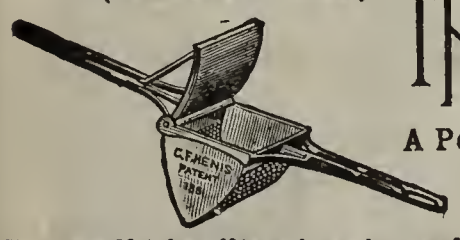
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Yet felt no jealous thrill
Though she found some lines from an old, old flame,
A great unpaid gas bill.
—*Chicago Inter-Ocean.*

— Mrs. Luneleigh (shopping with her husband): "Oh, George, look here! Doesn't this showcase of diamonds look perfectly beautiful?"

Mr. Luneleigh: "Yes, love. It would be a shame to take anything away from it, wouldn't it?"—*Chicago Record.*

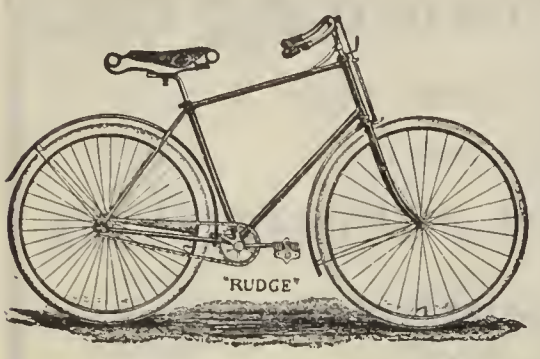
— Sharing Her Burdens.—Jaggs: "It's a shame to make your wife work so hard. Why don't you help her?"

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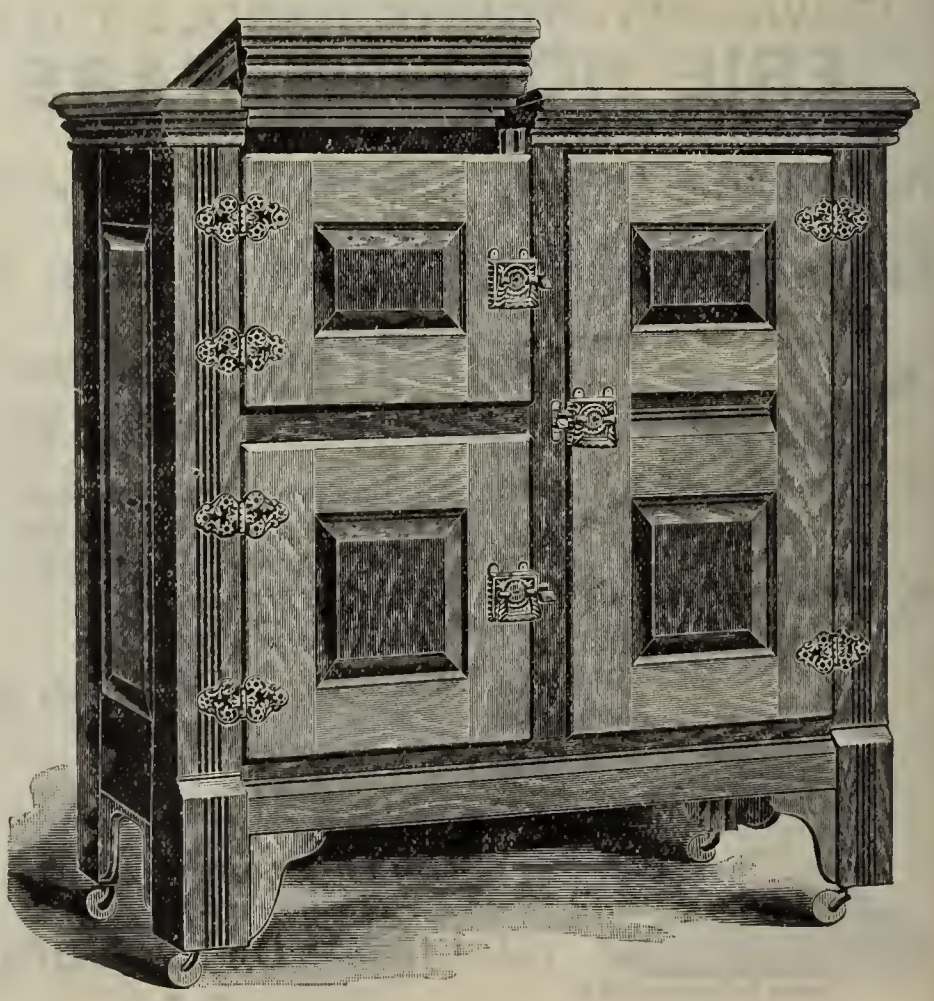
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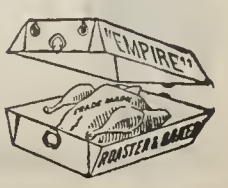
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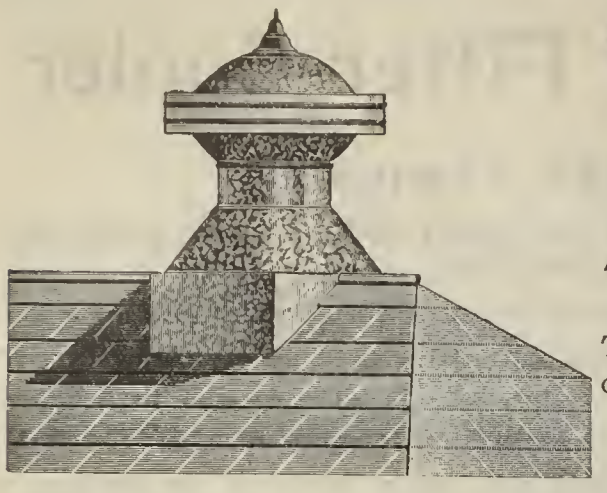
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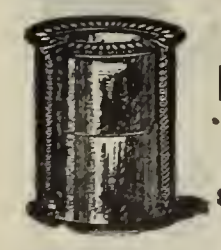
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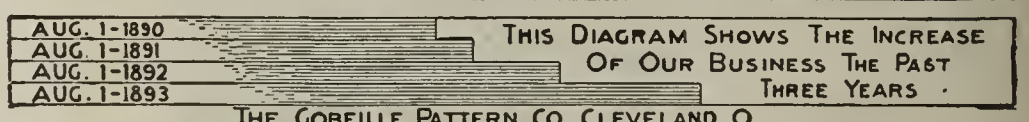
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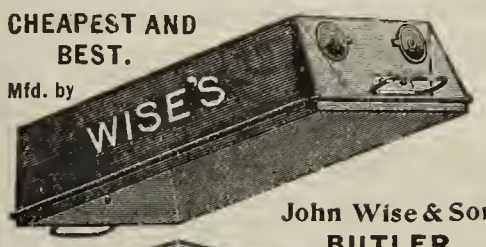
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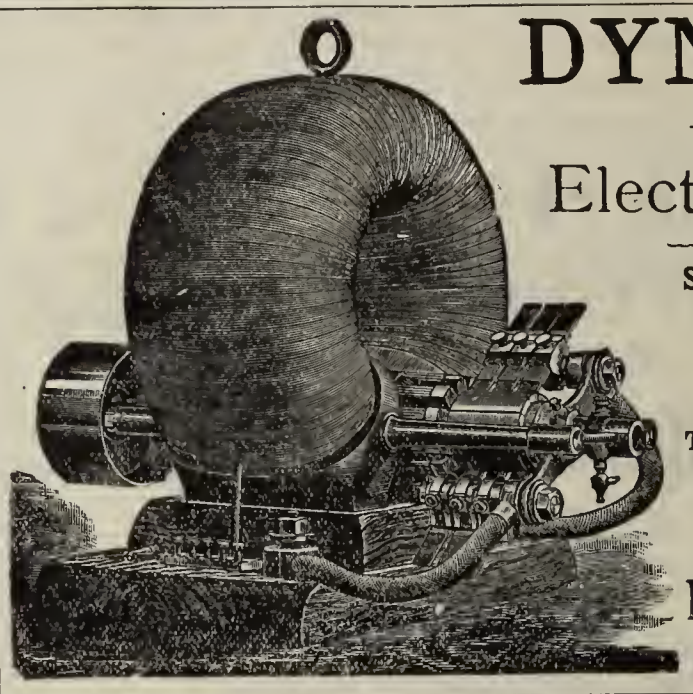
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The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published

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SIMPLE, DURABLE and EFFICIENT.

The Best Machine Made.
Satisfaction Guaranteed.

—THE—
Eddy Electric Mfg. Co.
Windsor, Conn.

ESTABLISHED 1820. INCORPORATED 1891

The Hanson & Van Winkle Co.,

MANUFACTURERS OF

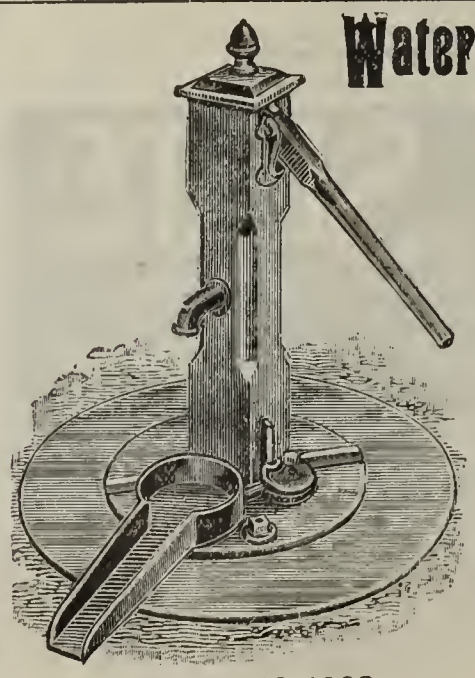


NICKEL AND ELECTRO PLATERS' MATERIAL.

Nickel-Plating Outfits
From $20 upward.
DYNAMO-ELECTRO MACHINES
For all purposes.
The New H. & V. W. Dynamo Machine.
In sizes from No. 1 to No. 5.
FROM $100 TO $500.
These machines will be placed on 30 days' trial with responsible parties, and if not satisfactory may be returned at our expense. Guaranteed 30% more powerful than any machine in the market at same price.

219-221 Market St., Newark, N. J.
81 Liberty St., New York.
35-37 South Canal St., Chicago, Ill.

WE FURNISH EVERYTHING.



Pat. Sept. 12, 1893.

Water, Pure and Undefiled.

The Neatest, Cleanest and most Substantial Cistern and Well Cover ever invented.

It shuts out all possibility of bugs or any kind of vermin getting into the Cistern or Well.

Send for Circulars and Price List.

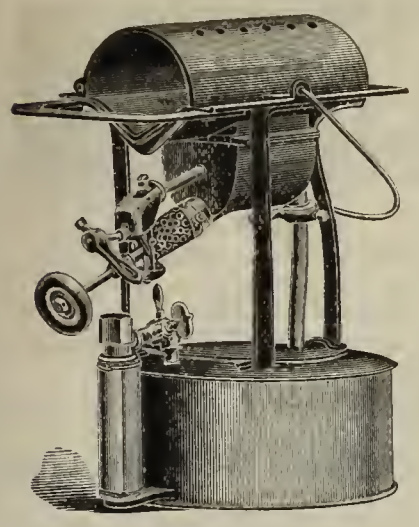
AGENTS WANTED.

MENEFEE & DeWILBISS,

Sole Manufacturers of

The Safety Cistern and Well Cover

FORT WAYNE, IND.



BONANZA NO. 1.

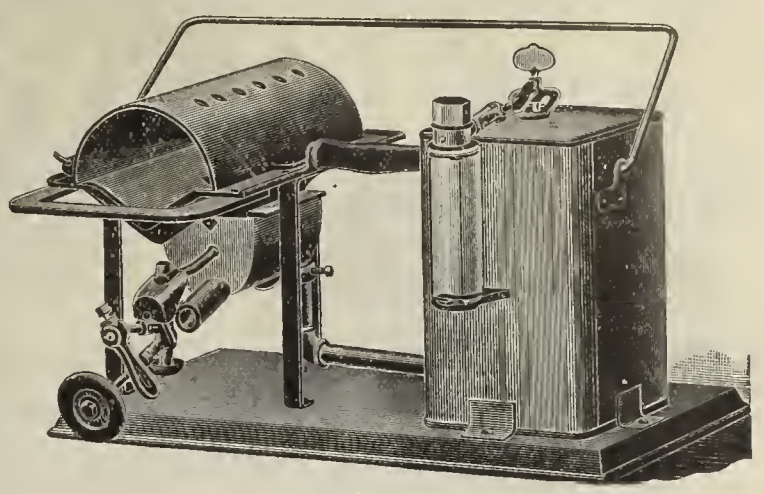
No. 1

BONANZA FURNACE

For tinners only.

PRICE $6.

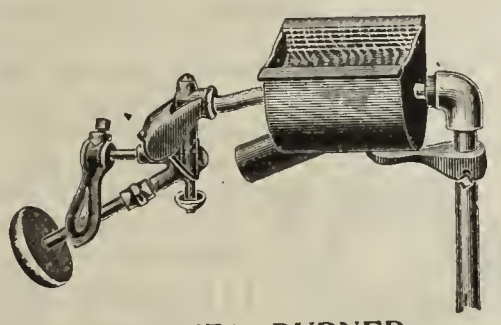
Hinged arch top. Galvanized steel with brass top tank. Best furnace for roofs or cornice work. Will heat the largest coppers. Cannot blow out. Rubber pump handle.



BONANZA NO. 3.

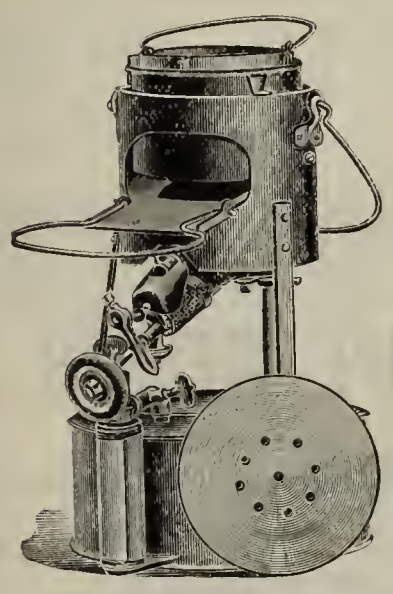
No. 2 BONANZA

Is for plumbers and tinners. Price $6.50, including lead pot and casing for plumber. Alone, price $6. Tank and burner same as No. 1. Bonanza No. 3 same as No. 1 except the arrangement of parts.

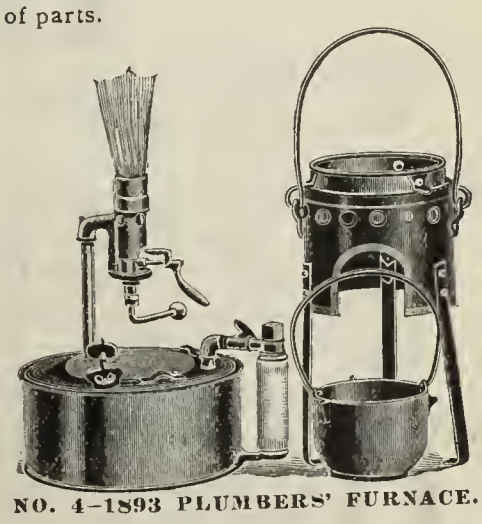


BONANZA BURNER.

Burns from both sides. Heat terrific; heats 5-pound coppers red in 3 minutes; heats 10-pound coppers in 5 minutes; melts 10 pounds lead in 5 minutes. Hottest fire ever produced from gasoline.



NO. 2 BONANZA.
For Plumbers and Tinners.



NO. 4—1893 PLUMBERS' FURNACE.

Write for New Catalogue and Poetry.

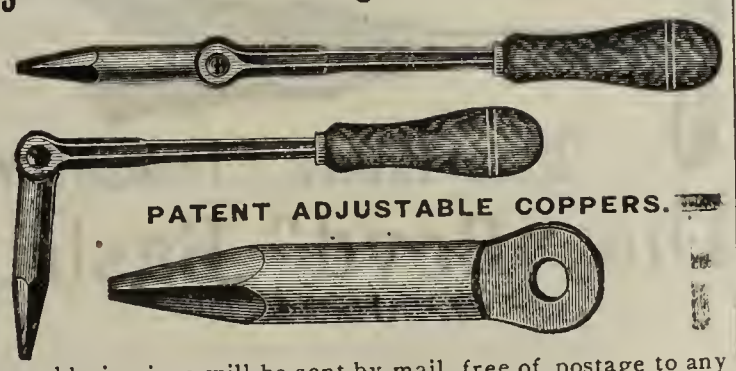
Special Low Prices for Cash with the Order.

M. L. HULL,

CLEVELAND, OHIO

Covert Pat. Adjustable Soldering Irons and Coppers

It is a complete tool in every respect and can be as easily adjusted at angle while hot as cold. The handle can be used indefinitely, as when the copper is worn out it can be replaced in the same handle, making the iron as good as new at about half the cost of the ordinary soldering iron.

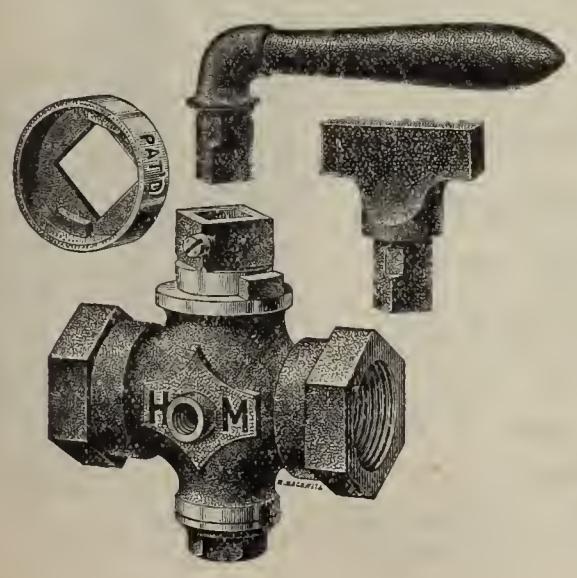


PATENT ADJUSTABLE COPPERS.

☞A sample of ⅞ in. soldering iron will be sent by mail, free of postage to any address, on receipt of sixty cents (60c.).

FOR SALE BY ALL GENERAL HARDWARE AND PLUMBERS' SUPPLY HOUSES.

COVERT MFG. CO., - West Troy, N. Y.



MUELLER'S

PATENT

STOP AND WASTE COCK

Can be used as either right or left hand, Tee or Lever Handle or Socket. Perfectly ground. Tested at 200 pounds water pressure and guaranteed not to break.

MANUFACTURED BY

H. MUELLER MFG. CO.

DECATUR, ILL.

Write for discounts. All goods marked H. M.

— "Are you the man that answers the queries?" asked the calier, removing his hat as he came in.

"I am," replied the man at the desk, pigeonholing a request for statistics as to the total number of persons killed in the Crimean war, and filing away in the waste basket a note asking for a brief biography of all the Presidents from George Washington down to Grover Cleveland. "What can I do for you?"

"I've got a little bet with a friend," rejoined the visitor, "and we've agreed to leave it with you. What is the size of glove that a perfectly proportioned woman with a No. 6 foot ought to wear?"

"The size of glove, you say?"

"Yes."

"That a perfectly proportioned woman ——"

"Yes."

"With a No. 6 foot should wear?"

"That's right."

"Just wait a few moments. I will consult the anatomical tables."

He waited. The man at the desk overhauled Pool's Manual, the "Wealth of Nations," Roget's "Thesaurus," Butler's "Analogy," Allibone's Dictionary of Quotations, Blaine's "Twenty Years in Congress," and a Concordance to Shakespeare, and turned to the caller.

"According to the best information I can obtain," he said, "a woman with a No. 6 foot, if she is perfectly proportioned, should wear on her hand——"

"Yes."

"Any glove that fits her. Turn the knob to the right. Good morning."—*Chicago Tribune.*

— Exhausting Labor Avoided. — Fweddy: "What's the big messengah boy following you awound foh?"

Cholly: "He's weahing my chwysanthemum foh me."—*Chicago Record.*

BROUGHTON SELF-CLOSING

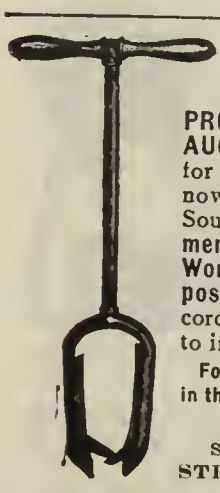
COCKS.

EVERY ONE WARRANTED.



Send for Circular.

E. STEBBINS MF'G CO. Sole Manufacturers
BRIGHTWOOD, MASS.



The Best in the World?

IWAN'S PATENT IMPROVED POST HOLE AUGER, which is unexcelled for easy and quick work, is now on exhibition in the South East Corner Department of Agriculture of the World's Columbian Exposition. Our friends are cordially invited to call on us to inspect our line of goods.

For sale by all Leading Jobbers in the U. S. and Canada.

IWAN BROS.,
SOLE MANUFACTURERS,
STREATOR - ILL.

Principles and Practice of Plumbing.

By S. STEVENS HELLYER. With illustrations. 294 pages, price $1.25. Sent on receipt of price by

DAVID WILLIAMS - Publisher & Bookseller,
96-102 Reade St., New York.

A NINETEENTH CENTURY STREET SCENE

The champion pugilist made a stir
As he passed along in his robe of fur
Up the street on a winter day,
And the country minister buttoned his coat,
A thin and shabby one, up to his throat,
And shivered and went his way.

— AUTHOR: "The second act of my drama winds up with a western cyclone."
Manager: "That ought to bring down the house."—*Raymond's Monthly.*

— A ROMANTIC MOMENT.—The Marquis Van Dickens (at the swellest ball in London): "Surely I have seen your beautiful face before, Miss Saintlouis?"
Miss Saintlouis: "More'n likely. Pa used it on all his patent medicine ads as 'after taking.'"—*Chicago Record.*

— FILLING A MAIL BOX.—Hayseed: "I don't understand these new fangled machines, Sallie. Now, this is the third nickel I have put in the slot and no gum yet."—*Raymond's Monthly.*

Don't Buy

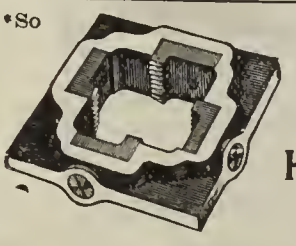
*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;
Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;
Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**
Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence** of quality.

If by chance you do not think these points, or the saving of money, objectionable,

*So



Send us a **Postal Note for 62 Cents** (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

HENRY B. PANCOAST & CO.,
PHILADELPHIA, PA., U. S. A.
SEND FOR CATALOGUE OF THE "SKELETON" PIPE DIE.

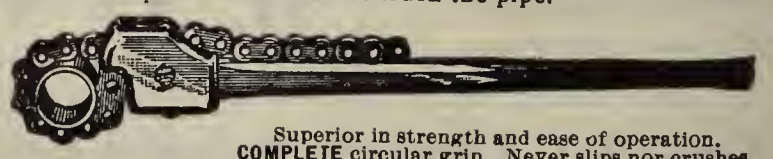


TRIMO PIPE WRENCH,

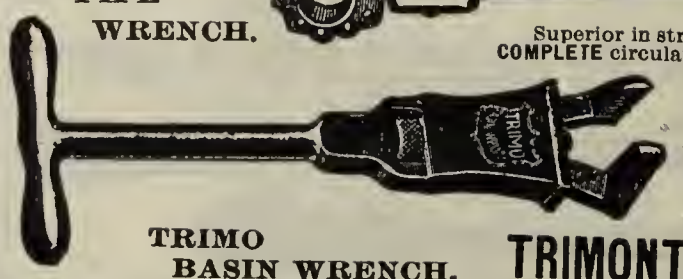
Forged Steel.
All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

TRIMO CHAIN PIPE WRENCH.



Superior in strength and ease of operation. COMPLETE circular grip. Never slips nor crushes.



Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.

TRIMO BASIN WRENCH.

TRIMONT MFG. CO., ROXBURY MASS.

The "Boyd" Basin.



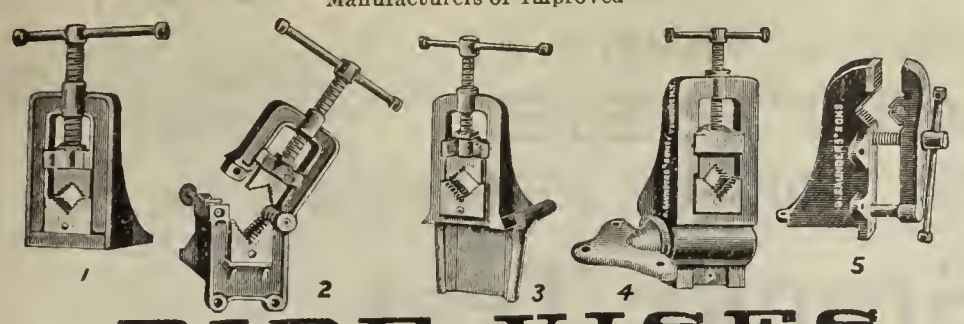
Made in Ivory Body and all styles of Decoration.

THE ACME OF SANITATION.
HAVE YOU SEEN IT?
IF NOT, GET POSTED.
We Will Post You.

PECK BROS. & CO.,
Fine Sanitary Goods,
47 Cliff St., NEW YORK 127 Chestnut St., NEW HAVEN, CONN. 259 Wabash Av., CHICAGO. 65 Oliver St., BOSTON.

D. SAUNDERS' SONS,

Manufacturers of Improved



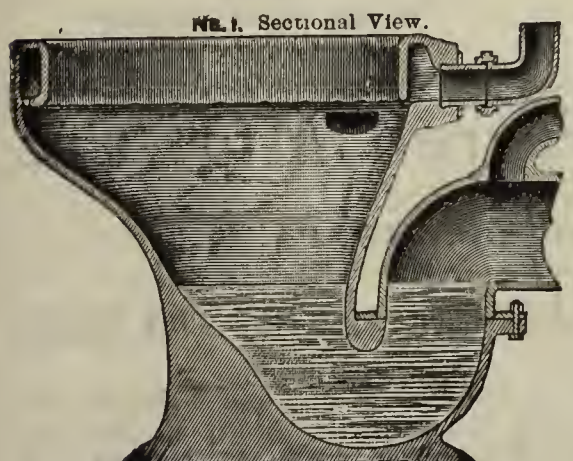
PIPE VISES

of all styles and sizes holding ⅛ in. to 8 in. pipe, made of MALLEABLE IRON, CAST IRON and STEEL Also PIPE THREADING MACHINES ¼ in. to 16 in., Hand Pipe Cutters, Stocks and Dies, Tapping Machines, etc. Send for catalogue to

27 Atherton Street, Yonkers, N. Y.

BOSTON HOPPER WATER CLOSET.

(TRADE-MARK.)



The bowl contains a pool of water 7 x 6 inches. This is a much larger pool of water than has ever been obtained heretofore in the Short Hopper principle; and until now it has been considered an impossibility to construct a Short Hopper with a large standing pool of water that would discharge its contents. This we do in the *Boston Hopper* with the same amount of water that is required to flush an ordinary Short Hopper.

In this closet we have also overcome the objectionable and dangerous connection between the earthen trap and soil pipe. The outlet of the *Boston Hopper* is so constructed that the point of connection between the trap and soil pipe is under the water line, and being submerged it must be absolutely tight against the leakage of sewer air. (For full view see our advertisement last week.)

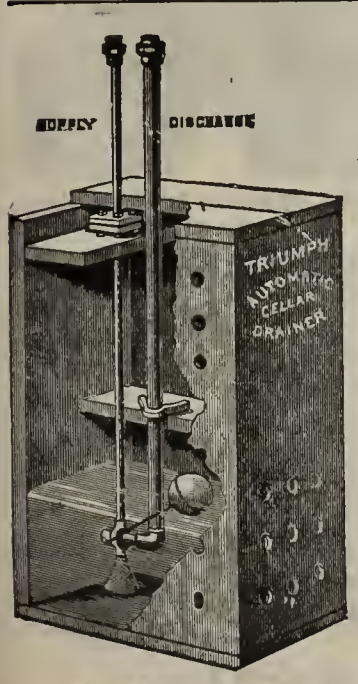
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WHOLESALE DEALERS IN PLUMBERS' SUPPLIES,

171, 173 & 175 High Street (Fort Hill Sq.), 55, 57 & 59 Purchase Street,

BOSTON, MASS.



A SURE CURE

—FOR—

WET CELLARS.

The Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

FRIEDENWALD BROS.,

216 N. Holliday St., Baltimore, Md., Sole Mfrs.

Pat. May 19, '85. Pat. May 26, '85. Pat. July 14, '85. Pat. Aug. 8, '86. Pat. Nov. 23, '86.



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Branch Warehouses:

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Manufacturers of



PUMPS,



Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

Yard Hydrants, Street Washers, &c.

Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

MYERS

TRADE MARK.

REVERSIBLE STEEL & WOOD TRACK HAY CARRIERS

A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.

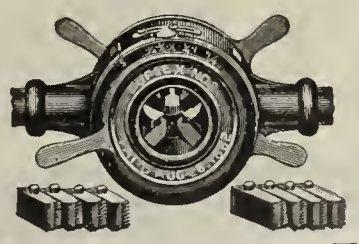


MYERS' FORCE AND LIFT PUMPS



Simple, durable, powerful, easy to operate never affected by frost. **Patent GLASS VALVE**, will never corrode. Ask your dealer for our goods. Write for catalogue.

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DUPLEX

DIE STOCK.

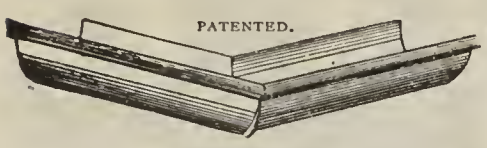
COSTS MORE BUT!

Lasts a lifetime and doesn't require strength of a giant TO WORK IT.

THE HART MFG. CO., - CLEVELAND, O.

Chucks The National. All sizes and styles. Pat'd **Reversible Jaws.** Ill'd Catalogue. The Standard Chuck since 1882. Address W. WHITLOCK, 39 Cortlandt St., N. Y. Works, 1300 Hudson, St., Hoboken, N.J.

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MITRES.

GUTTERS, EAVES TROUGHS, RIDGING, Etc., Etc.



Smoke Test Machine

FOR FINDING LEAKS IN

SOIL PIPE.

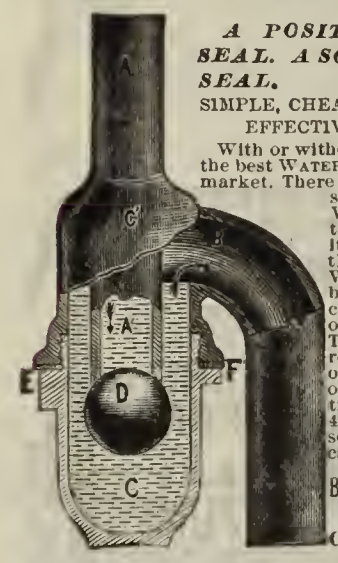
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THE BOWER

SEWER GAS TRAP.



A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

SIMPLE, CHEAP.

EFFECTIVE and DURABLE.

With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 48-page pamphlet sent free on application.

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Manufacturers,
Cleveland, Ohio

COLWELL LEAD COMPANY,

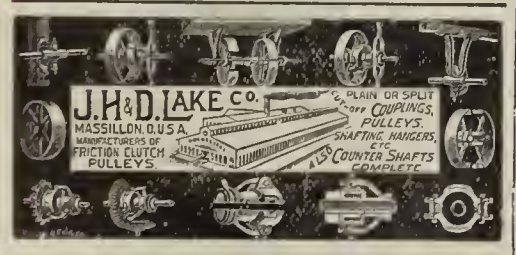
Centre St., and 681 Sixth Ave., Cor 39th St., New York.

Lead Pipe, Sheet Lead, Shot,

Plumbers', Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrough Iron Pipe of all sizes cut to order



LEATHER AND RUBBER

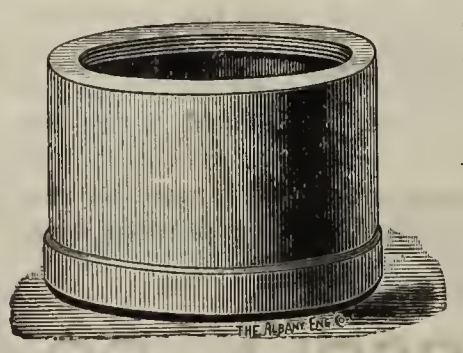
WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.





A Common Sense Trap Screw Ferrule.

The body is of cast iron in regular pipe sizes, fitting the Hub neatly and making a good wall to calk against. The **COVER** being of **BRASS** cannot unite with the iron and corrosion is prevented by the use of Graphite. A Common Sense Article at half the cost of brass.

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FOR SALE BY ALL DEALERS.

THE HOWELL PATENT



SHOWING SAFETY SPRING.

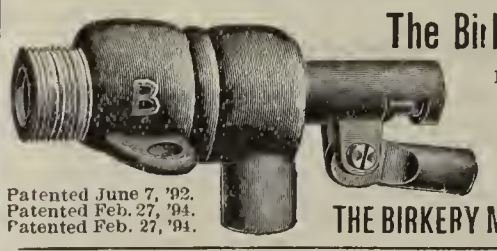
Rain Water CUT-OFF.

For turning the water into or off the cistern.

G. W. Howell,
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SHELL REMOVED, SHOWING VALVE



The Birkery High Pressure Ball Cock

Is the Best, Cheapest and most Perfect Working Ball Cock ever offered to the public.

It will not Sing or Hammer.

For sale by dealers in Plumbers' Supplies.

Patented June 7, '92.
Patented Feb. 27, '94.
Patented Feb. 27, '94.

THE BIRKERY MFG. CO., Sole Manufacturers, HARTFORD, CONN.



"OUR OWN" BASIN PLUGS

With Nickel Trimmings are the Neatest and Best.

SAMPLE DOZEN ASSORTED $1.

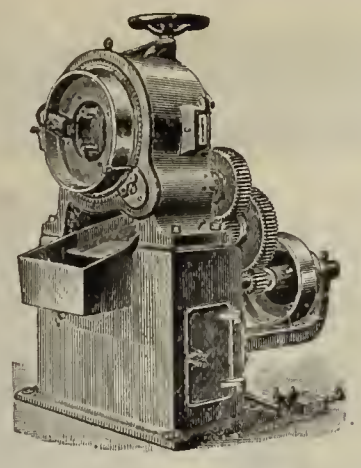


H. O. CANFIELD,

MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.



No. 3½ Power Pipe Threading Machine, Range 2½ to 6 in., Right Hand.

When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for **cutting and threading pipe.** Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

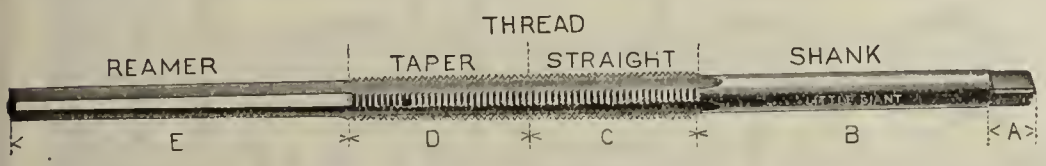
CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.

WE MAKE A SPECIALTY

—OF—

STAY BOLT TAPS.

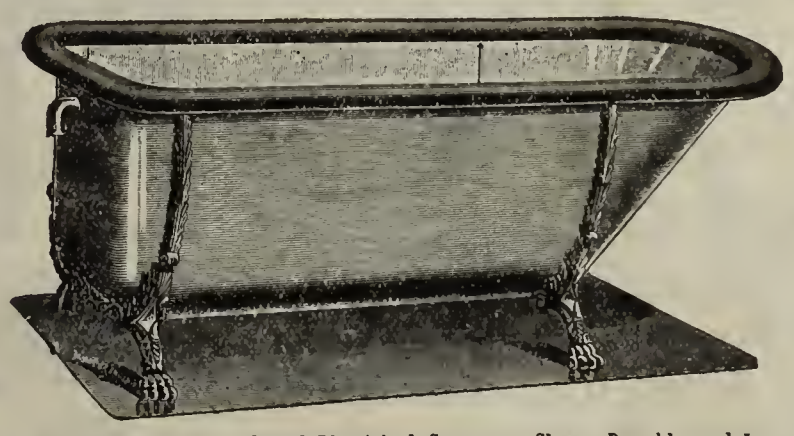


Parties using this class of taps will do well to cut this out, mark sizes and lengths on same and send to us for prices. We make any size desired and keep in stock a large variety of sizes and lengths, made up in the following proportions: One-third Reamer, One-sixth Taper, One-sixth Thread, One-third Shank.

Manufactured by **WELLS BROS. & CO., GREENFIELD, MASS., U. S. A.**

THE STEEL CLAD BATH.

No. 2.



Steel Clad. Lined with Tinned and Planished Copper. Clean, Durable and Inexpensive.

An Open Sanitary Fixture. For Sale by all Leading Jobbers.

—MANUFACTURED BY—

THE STEEL CLAD BATH CO. OF N. Y. AND THE STEEL BATH MFG. CO

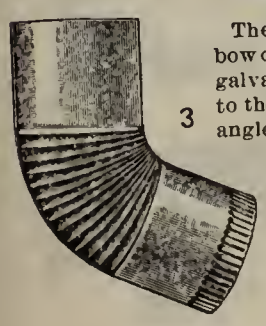
W. C. TRAGESER, Pres't.
447 to 453 W. 26th St., New York.

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The "O.H." One Piece CONDUCTOR ELBOWS.

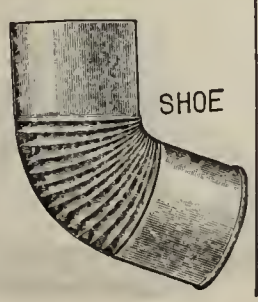
PLAIN, ROUND and CORRUGATED



3

The "O. H." is the strongest and most durable elbow on the market. Made of the best steel plate and galvanized after formation. Prompt attention given to the manufacturing of special elbows of any size, angle or material. Write for prices.

For Sale by all Jobbers of Tinners' Supplies.



SHOE

THE LAWRENCE-LETTS ELBOW CO., Ltd.,

MANUFACTURERS,

(P. O.) WAVERLY, N. Y.



The Climax Ratchet Stock

Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, — $10.00

No. 2 threads 1¼ to 2 in. pipe, takes 4 in. die, — 17.00

For sale by leading jobbers.

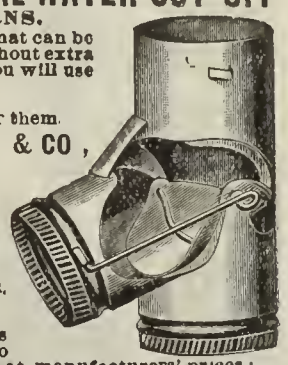
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THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.



It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.
Ask your jobber for them.

COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

4-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices: SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & CO., Chicago; CANTON STEEL ROOFING CO., Canton, O.; BERGER MFG. CO., Canton, O.; ACME ROOFING CO., Canton, O.; NILES MFG. CO., Niles, O.; GARRY IRON & STEEL ROOFING CO., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & CO., New Haven, Conn.; THE E. S. WHEELER & CO., New Haven, Conn.; WYETH HARDWARE & MFG. CO., St. Joseph, Mo.

CLARK'S ANGLE PLUG FAUCET

For Family Oil Cans, Etc.

(Patent applied for.)



The Faucet is constructed with a Plug set on an angle, making it very convenient, and has a double running thread. The liquid has a direct flow, which obviates oozing out through the threads; in fact, the objectionable points with other styles are overcome.

MANUFACTURED ONLY BY

THE CLARK NOVELTY CO.,

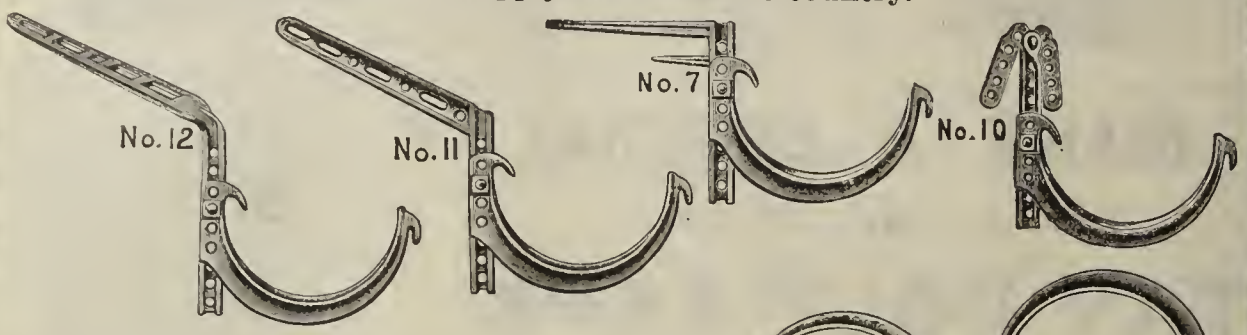
ROCHESTER, N. Y.

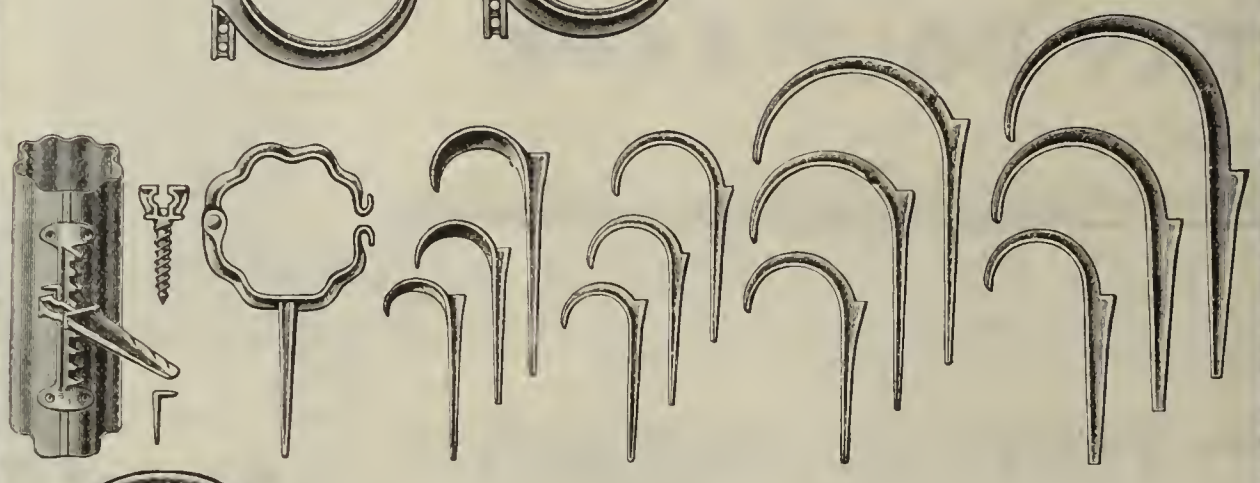


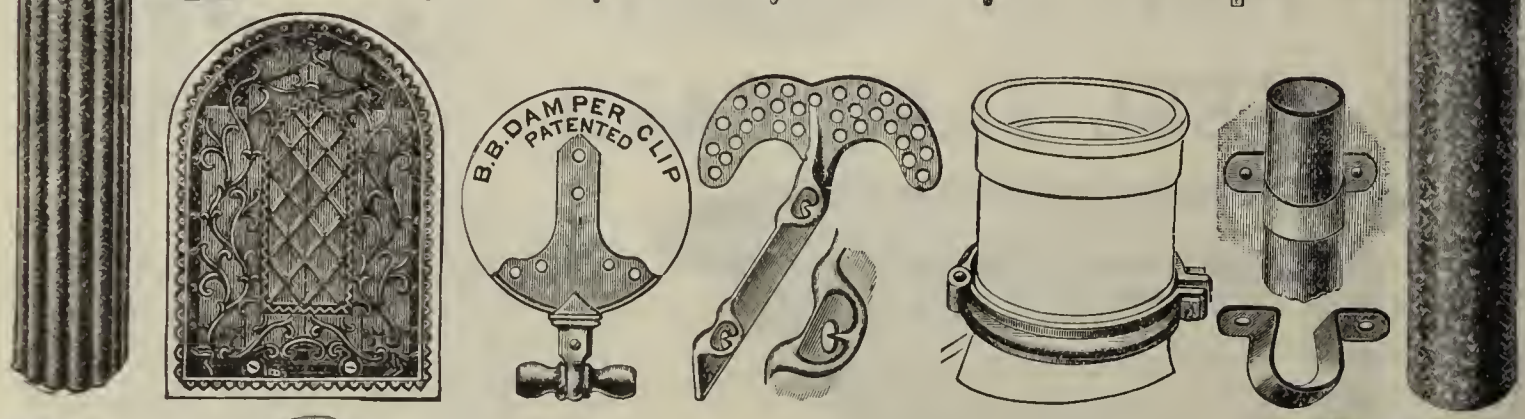
Tinners' Hardware. {BERGER BROS.} Roofers' Supplies

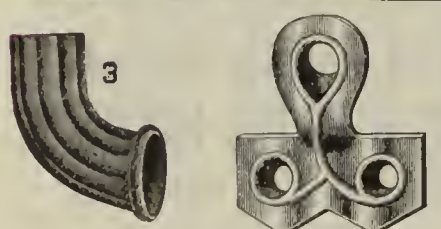
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Sole Manufacturers of the Berger Hangers and Fasteners. The most complete Tinners' Supply House in the country.



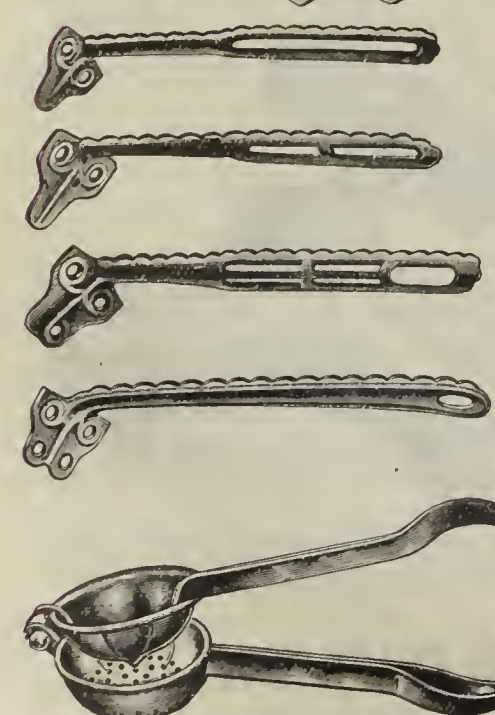


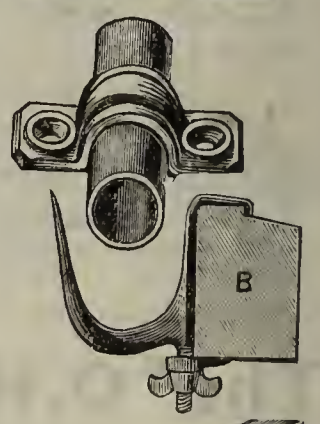




Steel Roofing, Black and Galvanized Sheet Iron, Corrugated and **V**-Crimp Roofing and Siding, Steel Brick, etc.





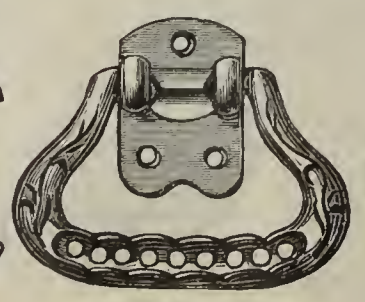


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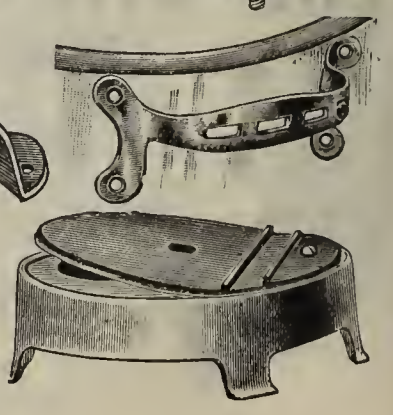
Berger Bros.,

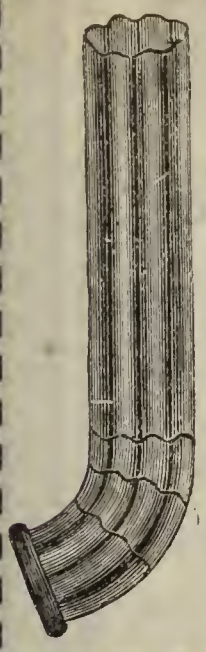
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POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested In all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



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Manufacturers

Office and Works, 237, 239 and 241 Bread St., - PHILADELPHIA, PA.

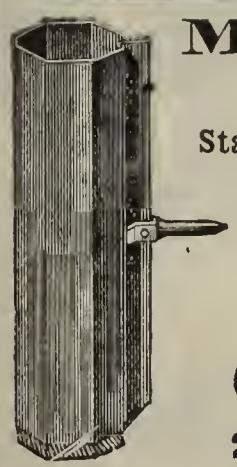
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CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.









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(INCORPORATED,)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

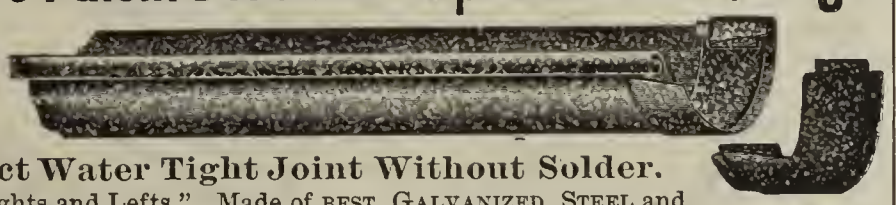
GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.



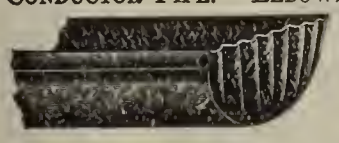
Holton's Patent Detached Slip Joint Eave Trough.

10 FEET LONG.



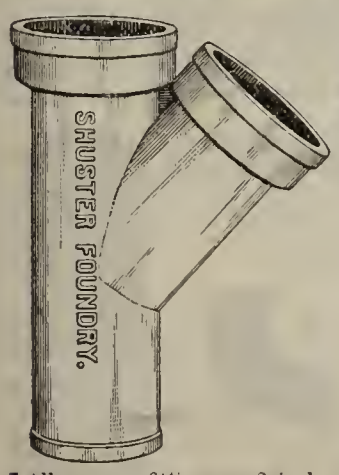
A Perfect Water Tight Joint Without Solder.

"No rights and Lefts." Made of BEST GALVANIZED STEEL and TIN. Also HOLTON'S PATENT "SOLID" END PIECE. PLAIN and CORRUGATED CONDUCTOR PIPE. ELBOWS, SHOES, HANGERS, ETC.



The Niles Mfg. Co., Niles, Ohio.

Mention this paper.



SHUSTER'S

Common Fittings.

SINGLE Y.

SIZES.

6 x 6 to 6 x 2 inclusive.
5 x 5 to 5 x 2 "
4 x 4 to 4 x 2 "
3 x 3 to 3 x 2 "
and 2 x 2.

Standard, medium and extra heavy weights.

Price-List on Application.

All common fittings are 2 inches longer on the bead end than those in general use, allowing plenty of room for caulking joints.

THE SHUSTER FOUNDRY,

Manufacturers of First Quality Tested and Guaranteed Soil Pipe and Improved Fittings.

Office and Warehouse, N. E. Cor. Franklin and Willow Sts., PHILADELPHIA, PA.

THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR

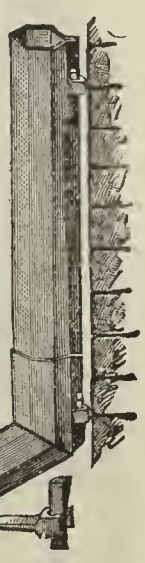
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S. S. S. CONDUCTOR CO.,

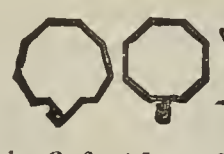
LIMITED,

163 Lacock Street,

ALLEGHENY, PA.



THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

Galvanized, Kalamelned or Leaded.

The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.



DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.

The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discounts

MADE BY

THE DAY MFG. CO.,

Detroit, Mich., U. S. A.

RITCHIE'S
Improved Corrugated
EXPANDING CONDUCTOR.



It combines all the advantages of the Corrugated Conductors now in use, with the following improvements.

Each 10-foot length is a single piece, the short joints not being soldered, but locked together, so that the joints cannot break apart.

The coupling or slip joint does not diminish the size of the pipe inside.

The galvanizing is free from dross or impurities.

For sale by all jobbers of Tinners' Supplies.

LAMB & RITCHIE,

Albany St., Cambridgeport, Mass.

231 Lake St., Chicago, Ill.

MANUFACTURERS ALSO OF

Ritchie's Spiral Pipe,

Standard Speaking Tube.



The Kelly
Self-Acting Frost-Proof After-Flush Closet.

For Extreme Cold Places and Out of Door Work.

When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

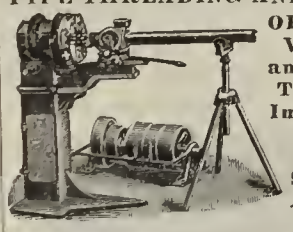
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124 Franklin St., Chicago,

Manufacturers of Permanent Plumbing Goods.

PIPE THREADING AND CUTTING



OFF MACHINES, WATER, GAS and STEAM FITTERS' TOOLS, Improved Hinged Vises, Pipe Wrenches, Stocks and Dies.

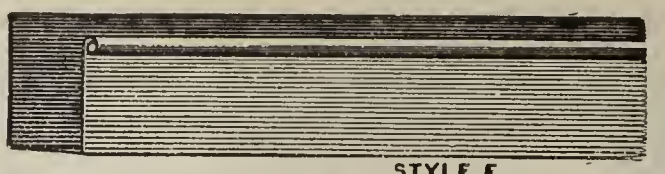
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Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

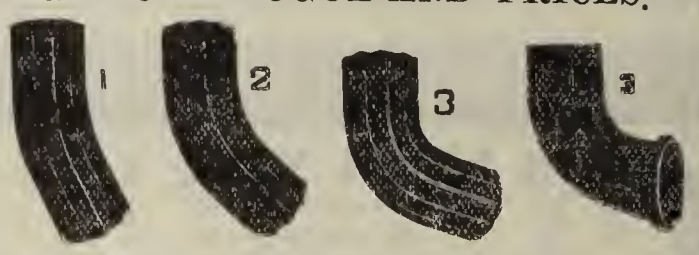
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Corrugated Conductor, Galvanized Eave-Trough, Wire Eave-Trough Hangers.

We make the best goods in the world and our prices are reasonable.

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CANTON, OHIO, U. S. A.

MANUFACTURERS OF

Patent Eave Trough and Hangers, Conductor Pipe, O. G. and Box Gutters, Ridge Roll and Capping, Ventilators, Finials, Cresting.

Patent Steel Roofing,* Metallic Shingles, Crimped, Beaded and Corrugated Iron, Iron Weather-Boarding, Sheet Steel Pressed Brick, Mixed Roof Paint, Building Paper, etc.†

* Write for sample.

† Get Illustrated Catalog.

CONDUCTOR Pipe.



Corrugated Expanding Conductor

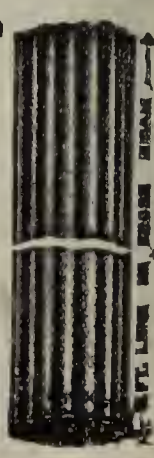
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ANTI=PINHOLE

BRIGHT TIN PLATE.

The Only Absolutely

ANTI=PINHOLE plate ever made.

We are the only house that has successfully introduced a genuine ANTI-PINHOLE Plate. Two years of actual test have demonstrated this fact.

GUMMEY'S ANTI=PINHOLE PLATE

is, without exception, the heaviest coated Bright Plate that has ever been made. Parties who have used it are duplicating their orders.

GUMMEY, SPERING & CO., Importers and Manufacturers Tin Plates, Etc., Philadelphia.

REDIPPED PLATE

All Pure Palm Oil Process.

Wilkinsburg Redipped.

The most uniformly coated and best finished plate on the market. We also manufacture the McKinley Standard Plate, guaranteed equal to any made. Prices and samples on application.

McKINLEY TIN PLATE CO., - Wilkinsburg, Pa.



United States Iron and Tin Plate Mfg. Co.

THE PIONEER TIN PLATE WORKS IN THE UNITED STATES OF AMERICA.

Send for our descriptive pamphlet, it contains information of value to the trade.

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Eastern Branch, ELY & WILLIAMS,

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TINPLATE

Bright and Roofing.

MANUFACTURED BY

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ÆTNA-STANDARD IRON & STEEL CO.,

Successors to Ætna Iron and Steel Co., and The Standard Iron Co.,

MANUFACTURERS OF

PLATES and SHEETS, BLACK, GALVANIZED and CORRUGATED Plain Roofing, Siding and Ceiling, also of Sheet Steel for special purposes, Cold Rolled or Plain and Patent Leveled.

BARS, LIGHT SECTION RAILS, ANGLES, TEES and CHANNELS, odd sections and sizes, Machine Straightened Steel Tire, Ordinary Shafting, Horse-Shoe Bars, Ax-Poll Steel, Toe Calk, Nut, Bolt and Chain Rods, and other special Bars suited to every requirement.

PROMPT SHIPMENT FROM STOCK.

Inquiries solicited. Stock List Mailed on Application. Address

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Means "at length," hence we adopt the brand "TANDEM" for our **continuous roofing tin,** which is entirely unlike any other coated continuous roofing :

1st. The sheets are 96 inches long before locking.
2d. Less seams and therefore less liability to leaks.
3d. Specially adaptable for gutters and valleys.
4th. Not an inch lost to the buyer on account of corners being off.
5th. No re-squaring to be done.
6th. Seams soaked on both sides during process of coating.
7th. Courses absolutely straight.
8th. Shipping weight less than regular 20 x 28 roofing tin.
9th. Full weight plates.
10th. You are prepared to lay a roof on sight.
11th. If you are doing work away from home the plates can be shipped direct, thereby saving freight and handling.
12th. Labor, soldering and general material saved.

The other dozen advantages will quickly be seen by the intelligent roofer.

These plates are of a fair quality, not an Extra Coated Plate, but of a decidedly good kind.

If you want to keep up with this progressive age write for prices, stating quantity required, of the "TANDEM" brand of Roofing Tin.

When you consider our prices consider also the material, labor and freight you save.

MERCHANT & CO.,

INCORPORATED.

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TIN AND TERNE PLATES,

GALVANIZED AND BLACK SHEET IRON, SHEET COPPER,

MORTIMER H. CORT, AGENT,
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REAL OLD METHOD

MANUFACTURERS OF "NEW CASTLE" BRANDS OF GUARANTEED

Tin and Terne Plate.

Lake Superior Ores only used in our Steel Works, from which we roll our own Black Plate.

New Castle Steel and Tin Plate Company, - New Castle, Pa.

T. G. McCLURE. J. J. O'CONNOR.

McCLURE & CO.,

TIN PLATES AND METALS, 62 SECOND AVE., PITTSBURGH, PA.

WE INVITE CORRESPONDENCE BEFORE BUYING.

AMERICAN CONTINUOUS ROOFING TIN.

Put up in rolls of 100 square feet, each roll 60 feet long by 20 inches wide. The rolls are perfectly straight, with cross seams every 8 feet. Seams are thoroughly soldered during the process of coating.

P. B. CALVERT & CO.,
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OUR BRANDS

MERRY'S OLD METHOD Roofing Plate.
Imported.
MONARCH Old Style Terne.
Imported.
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ALL RE-SQUARED, STAMPED AND GUARANTEED.

MERRY & CLARK,
Successors to JOHN MERRY & COMPANY,
SOLE IMPORTERS,
535 to 547 WEST 15th ST., NEW YORK CITY. Correspondence Solicited.

LAWSON'S OLD PROCESS

Equal to any ever made. Made of the finest "Siemens" Steel. Extra tough, and extra coated or re-dipped. Each sheet re-squared and stamped "LAWSON'S OLD PROCESS."

GUARANTEED ROOFING PLATE.

THE F. H. LAWSON CO.,
TINNERS' SUPPLIES, TOOLS AND MACHINES,
MANUFACTURERS OF
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186, 188 & 190 MAIN STREET, CINCINNATI, OHIO.
Wholesale Agents for THE LEONARD REFRIGERATORS.

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MANUFACTURER OF
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Also,
JUNIATA, CHARCOAL, REFINED and COMMON COLD ROLLED SHEET IRON.

Corrugated Roofing, *Fine Steel Sheets a Specialty.*

— OUT OF THE ORDINARY.—"Say," said the regular customer of the side street restaurant as he stopped at the desk to pay his check, "where did you get that beef you are serving to-day?"

"What's the matter with it?" aggressively asked the cashier, who scented another kick.

"There's nothing the matter with it; that's why I asked."—*Life.*

— "DOES Fred seem to ever regret his club life?"

Mrs. Nuwife: "No, never."

"How do you feel so sure of it?"

Mrs Nuwife: "He spends all his time there."—*Inter-Ocean.*

AMERICAN TIN PLATES.

WE ARE MAKING AT OUR OWN WORKS

ALL KINDS OF

ROOFING AND BRIGHT PLATES

superior to any of the imported brands.

WRITE FOR PRICES.

MEURER BROS. CO.,

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JOHN DUNLAP COMPANY'S

SPECIAL BRAND ROOFING PLATES.

SUPERIOR GRADE.

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PALM OIL PROCESS.

EVERY BOX GUARANTEED. **PITTSBURGH, PA.**

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IRON and STEEL, HEAVY HARDWARE,

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BLACK AND GALVANIZED SHEETS.

Roofing Plates. { "STAPLE" Brand. I. C. 20 x 14. 28 x 20.

BARS, RODS, SHAPES AND PLATES.

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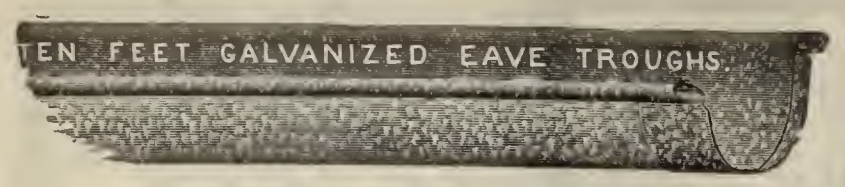
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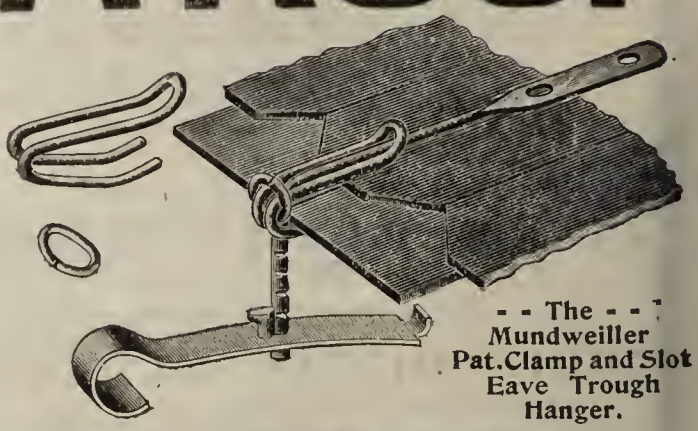
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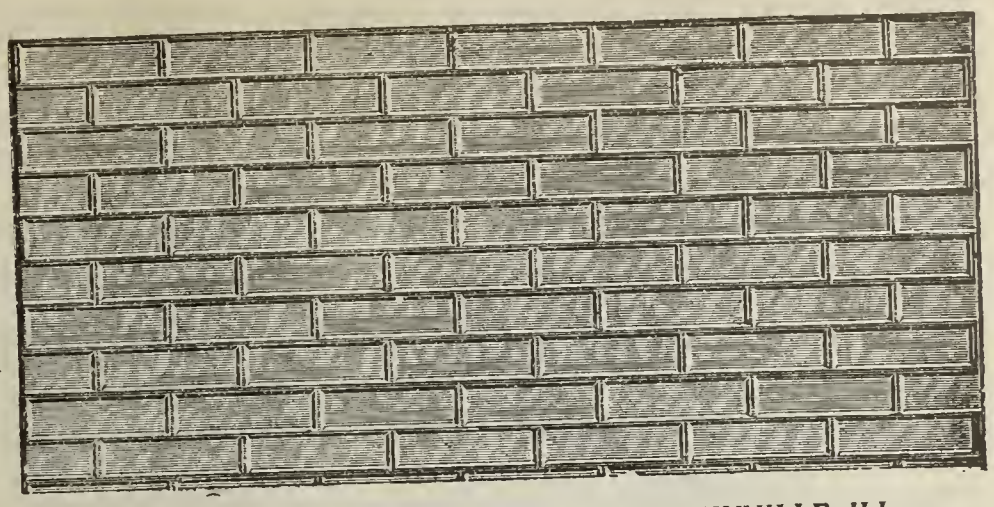
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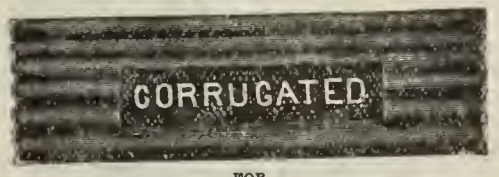
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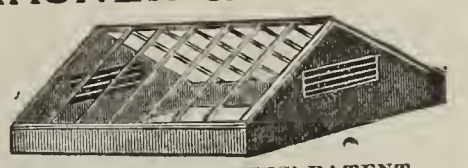
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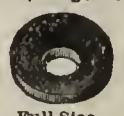
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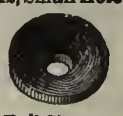


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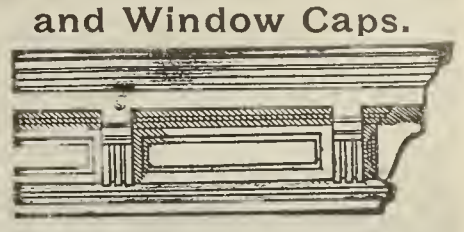
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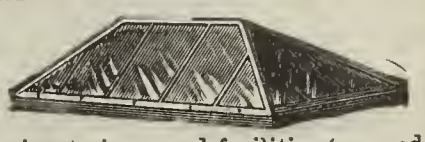
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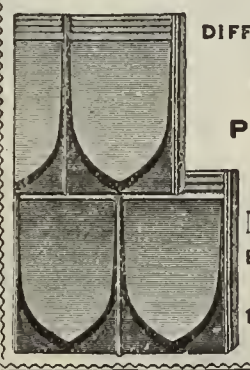


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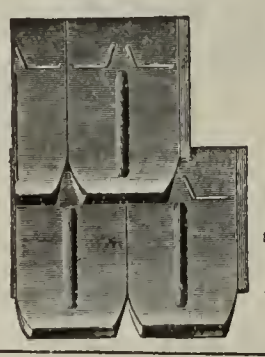
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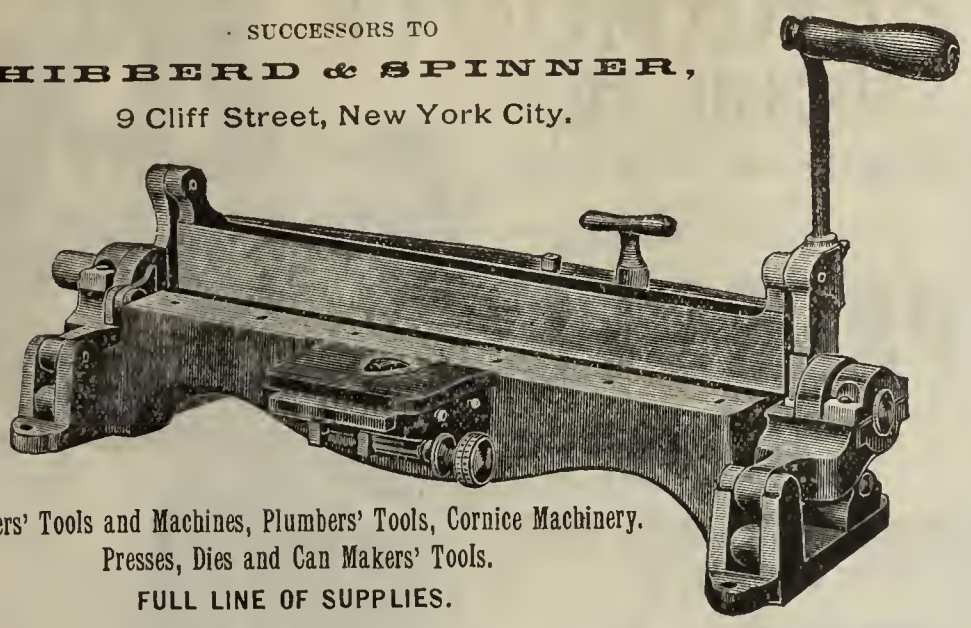
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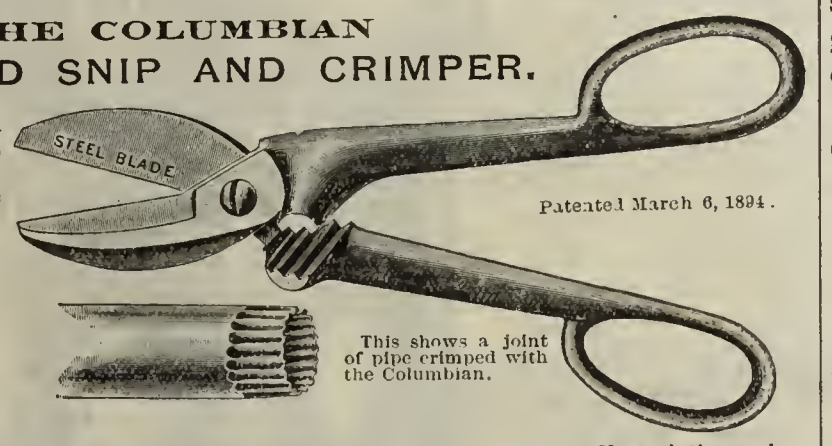
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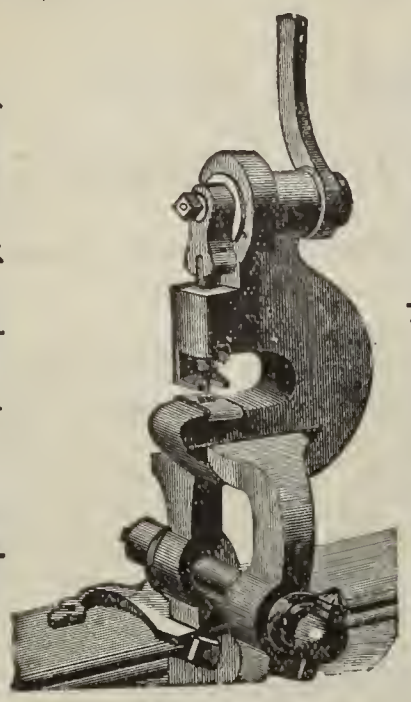
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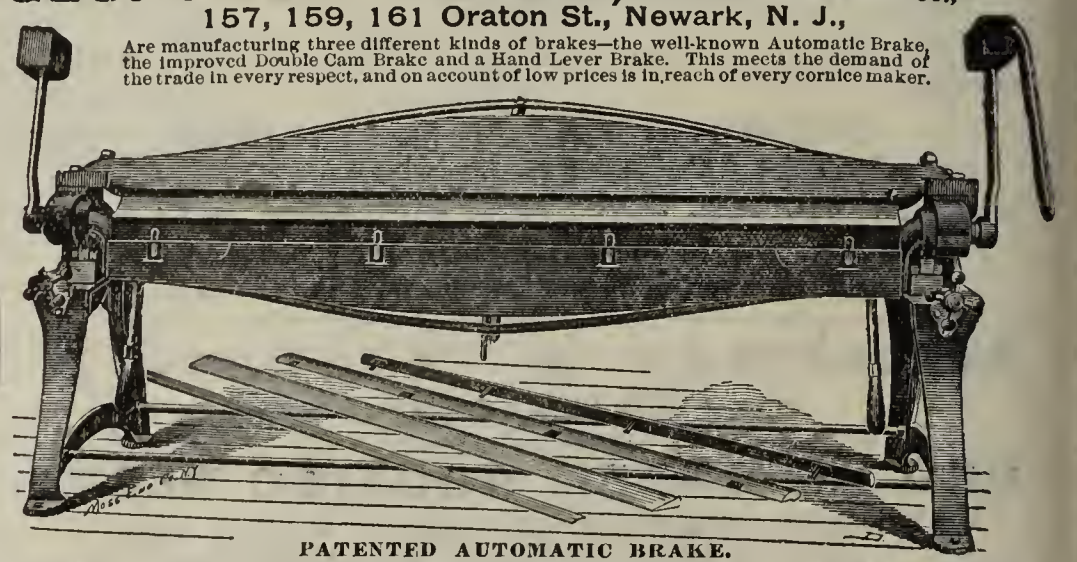


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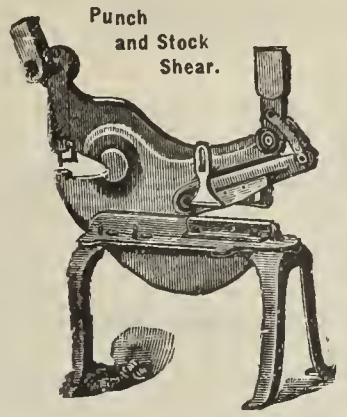
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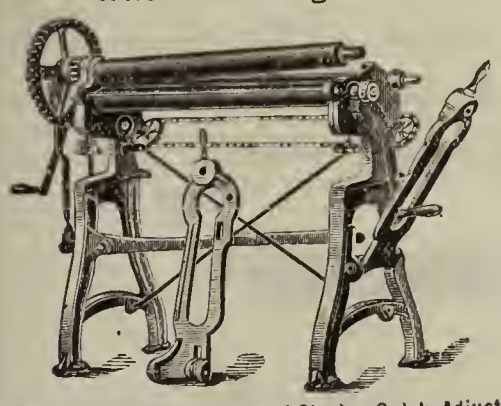
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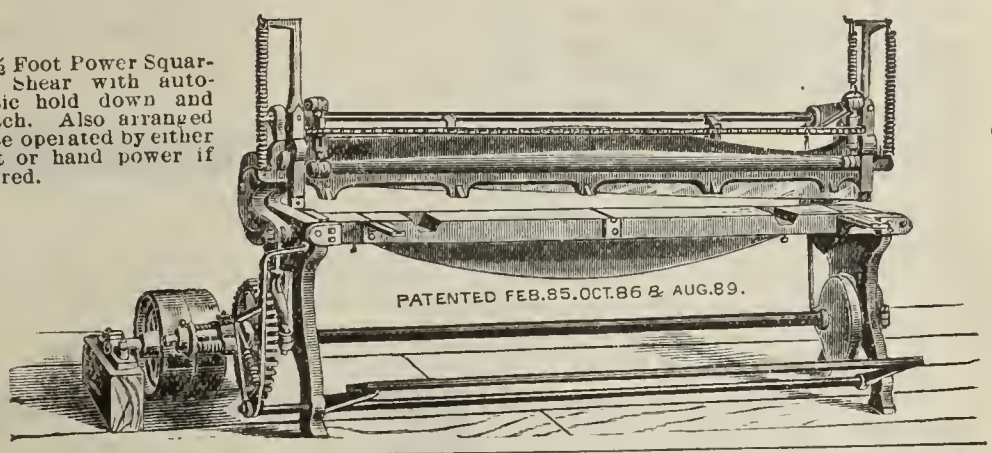


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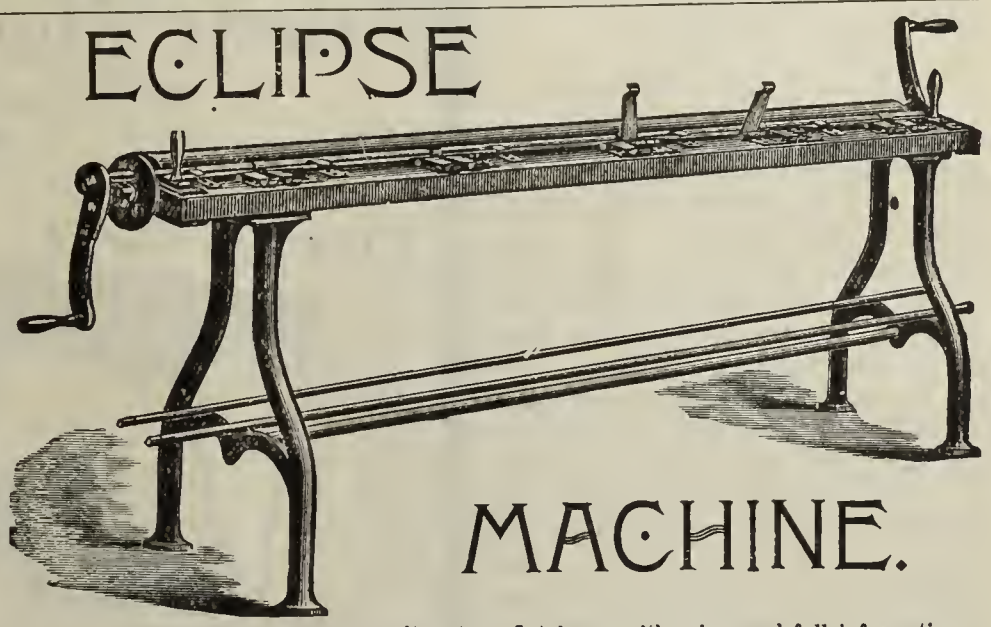
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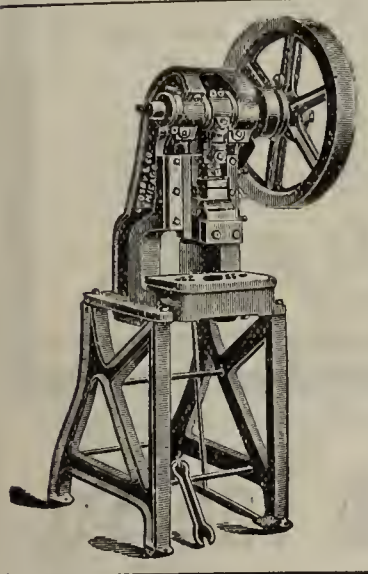
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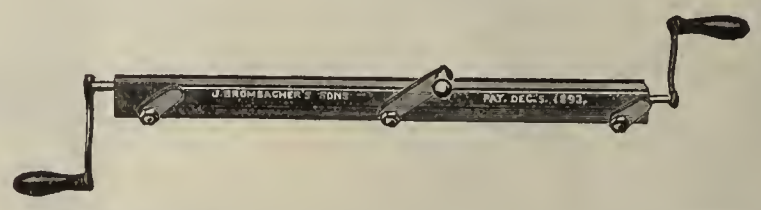
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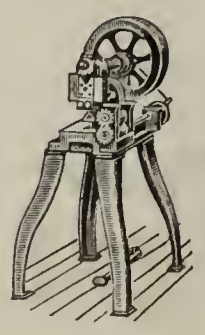
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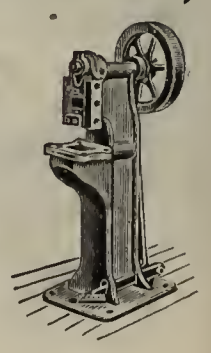
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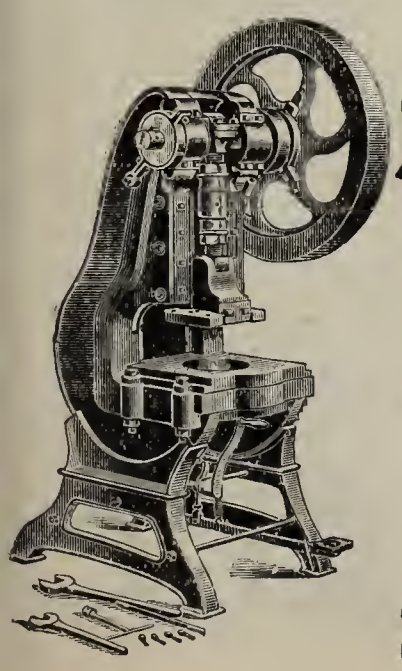


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Stark Machine & Tool Co., Buffalo N. Y.
Stiles & Parker Press Co., Brooklyn N. Y.
Tinners' Machinery & Supply Co., Cliff St., N. Y.
Toledo Machine & Tool Co. Toledo, O.

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Bischoff, F. F. & Co., Chicago, Ill.
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Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Thorn Shingle and Ornament Co. Philadelphia, Pa.
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Galt, Jno. & Sons, 253 Broadway, N. Y,
Salem Nail Co., 292 Pearl St., N. Y.

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Taylor, N & G. Co., Philadelphia, P

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Covert Mfg. Co., W. Troy, N. Y.

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Ostrander, W. R. & Co., 204 Fulton St., N. Y.

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Rutland Fire Clay Co., Rutland, Vt.

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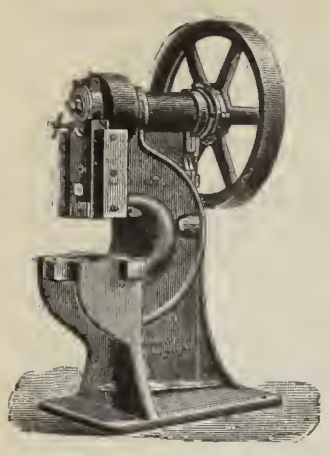
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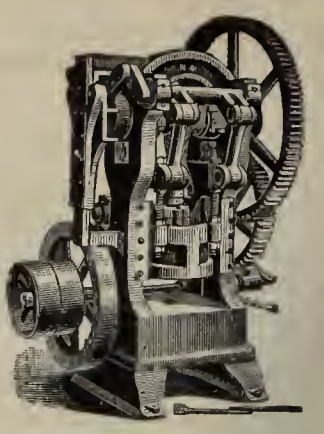
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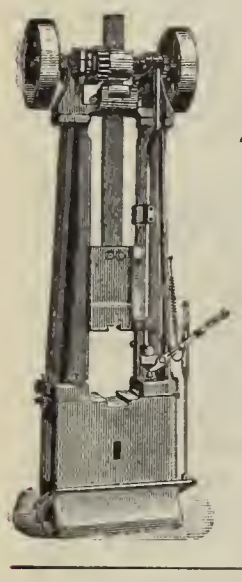
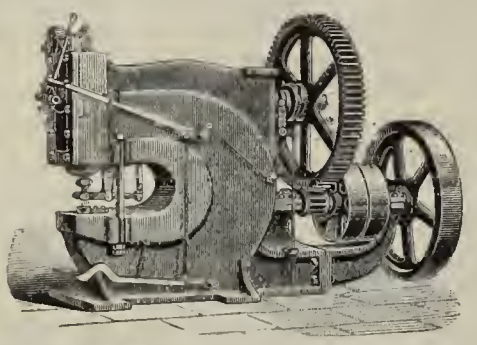
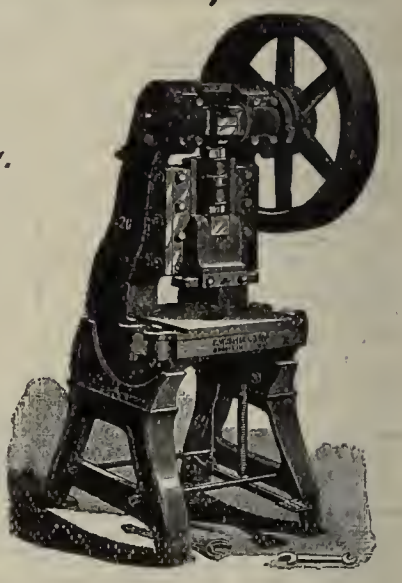


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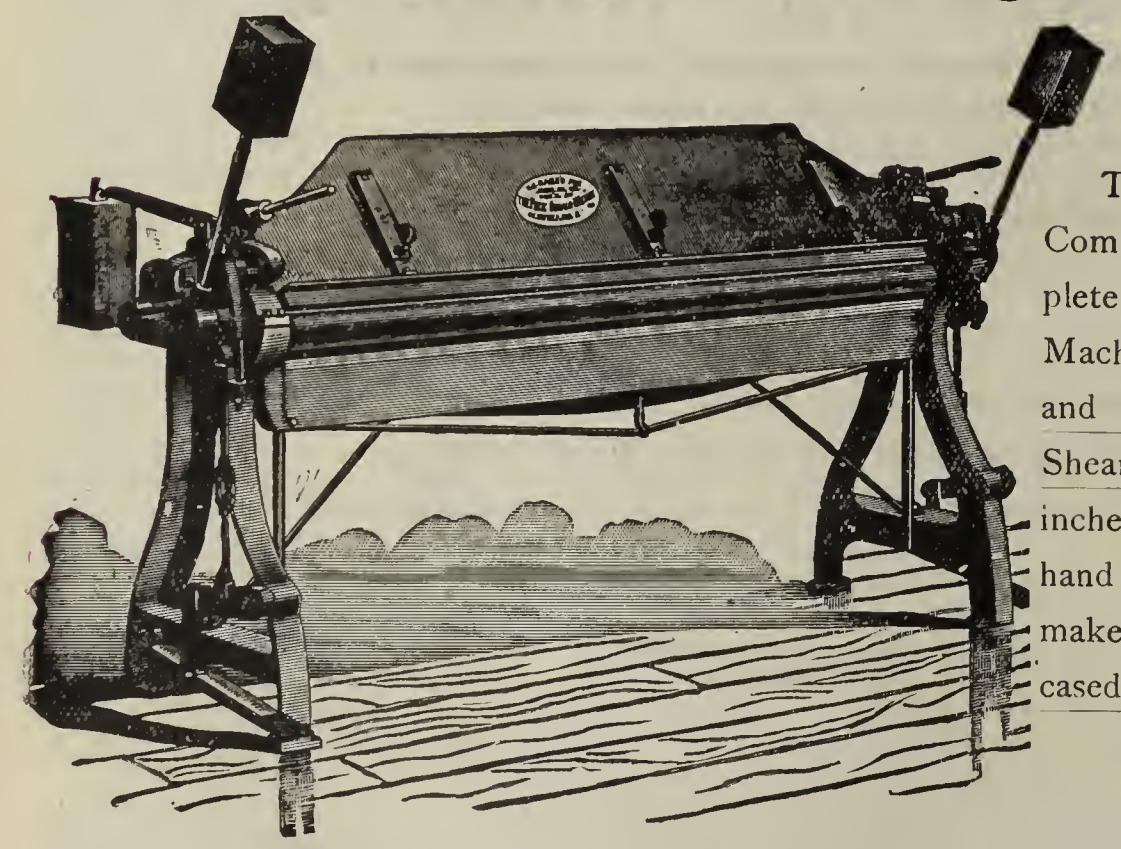
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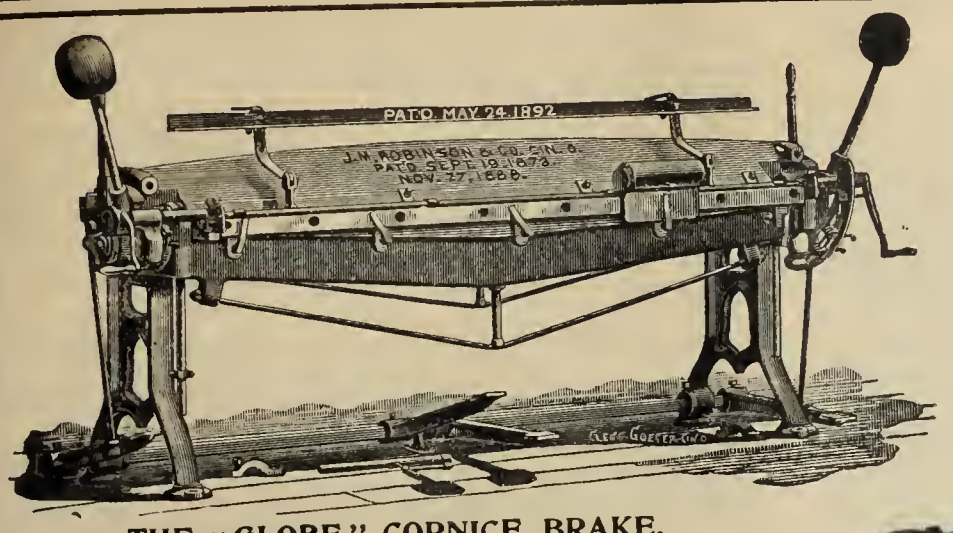


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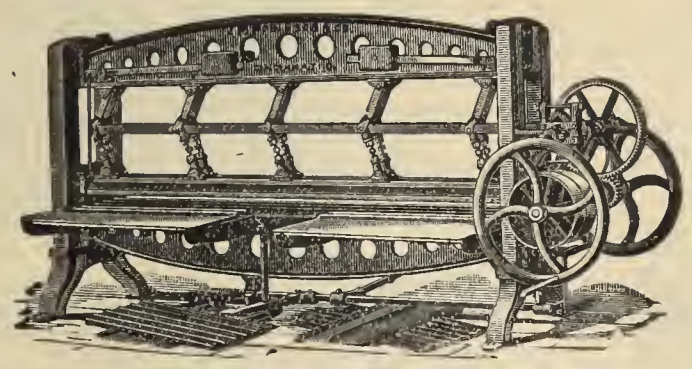


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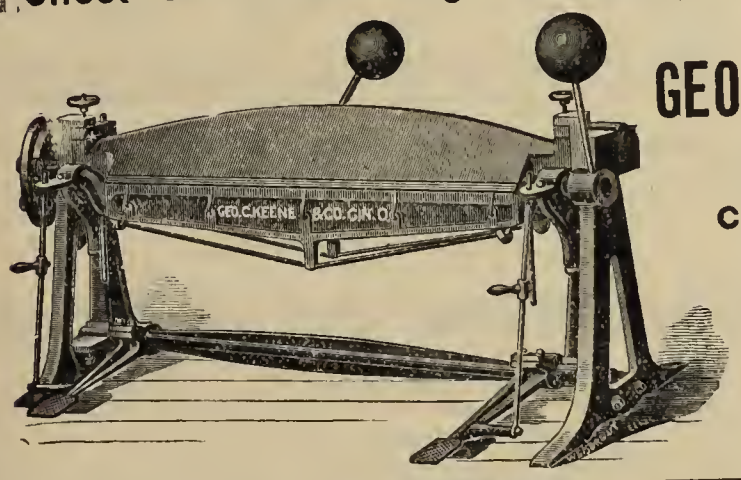
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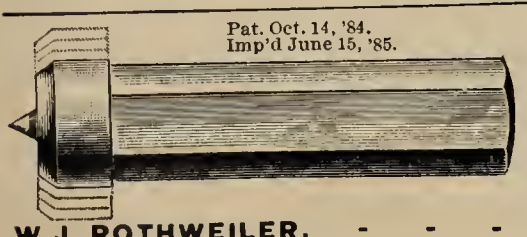
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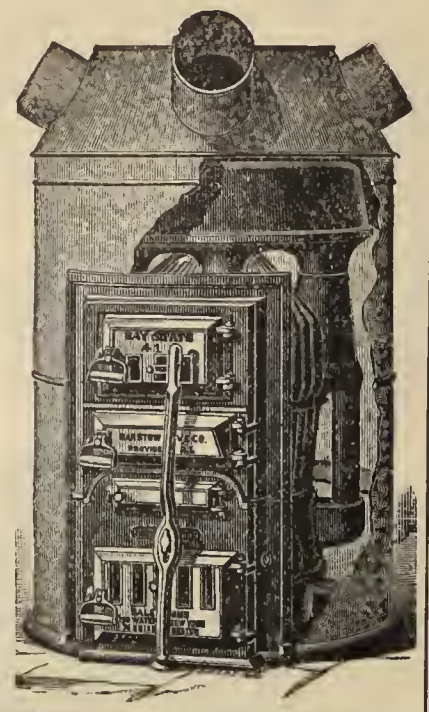
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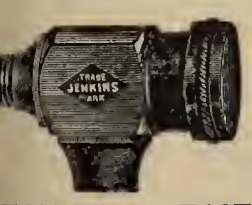
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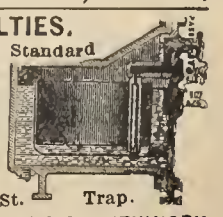
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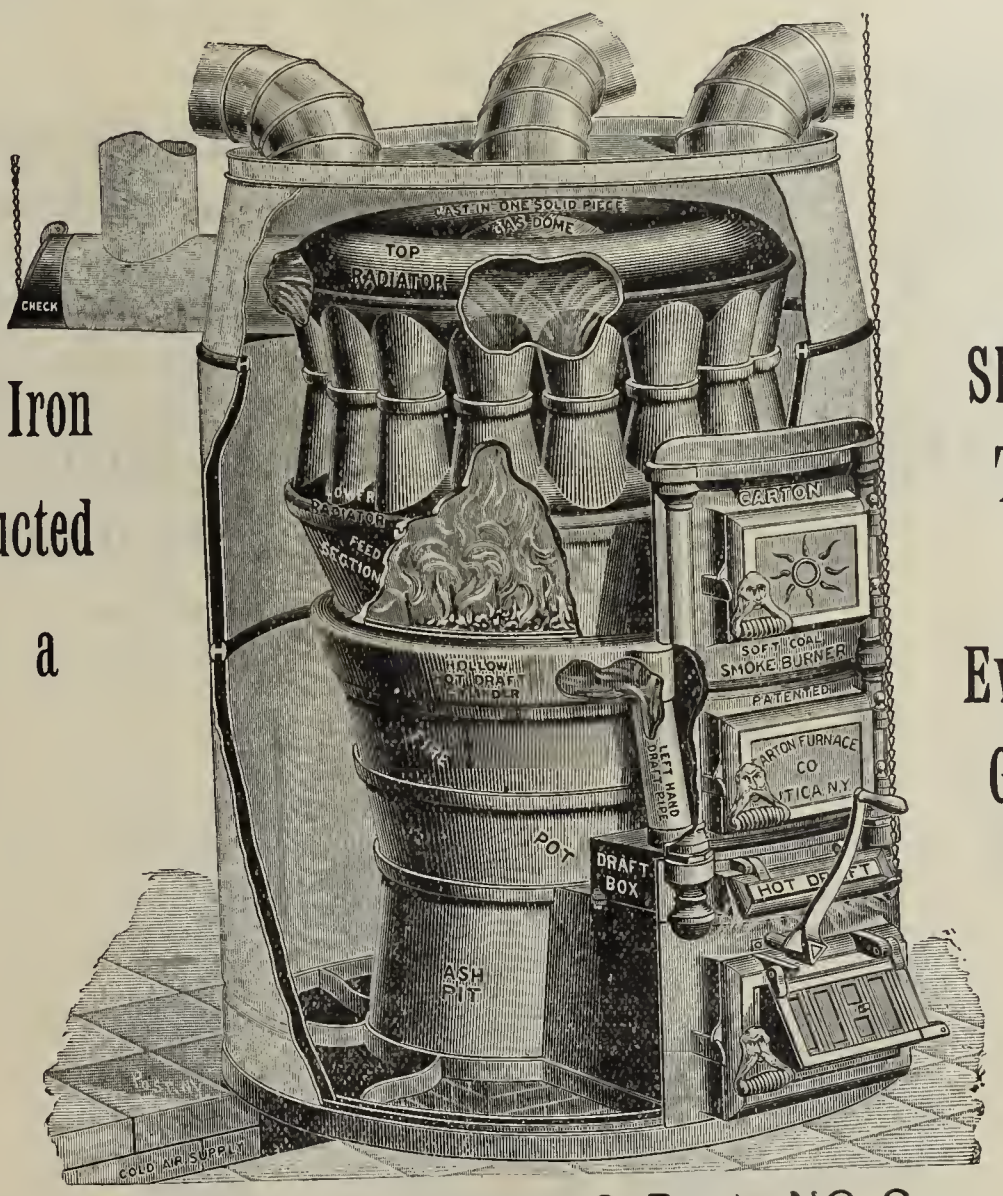
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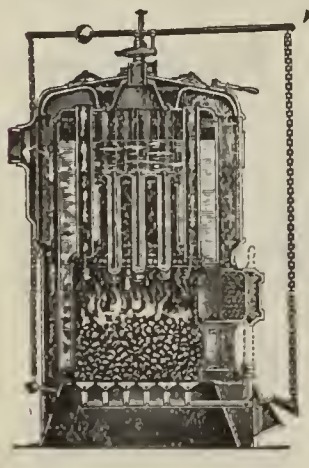
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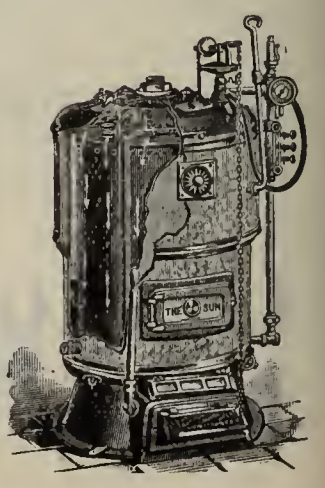


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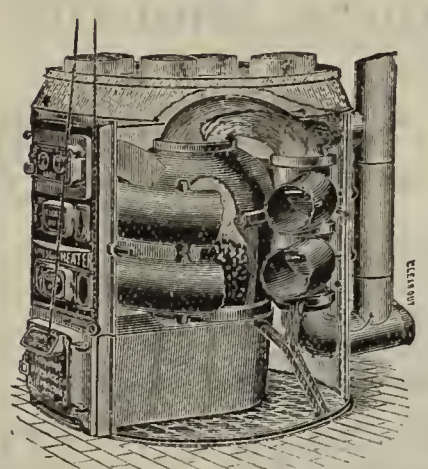
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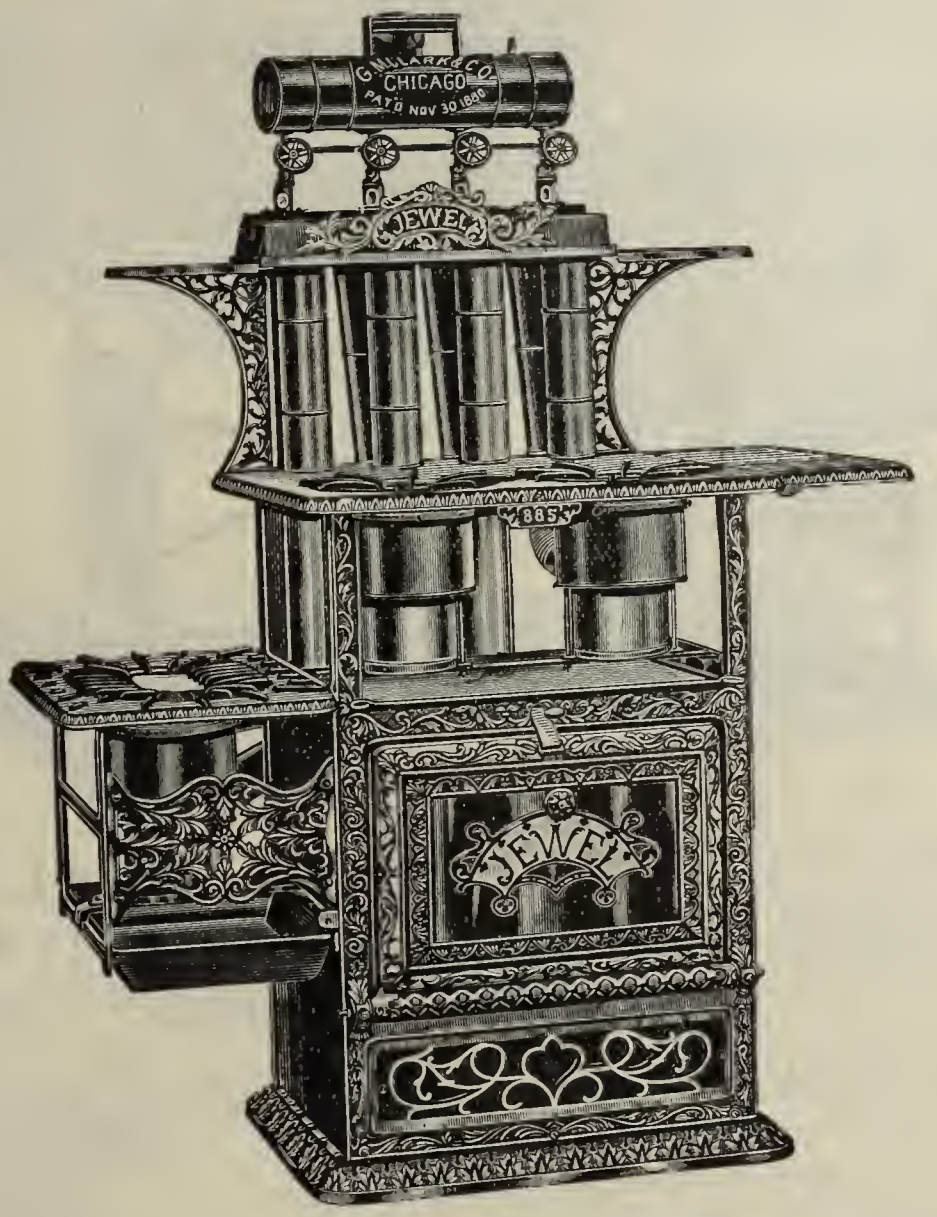
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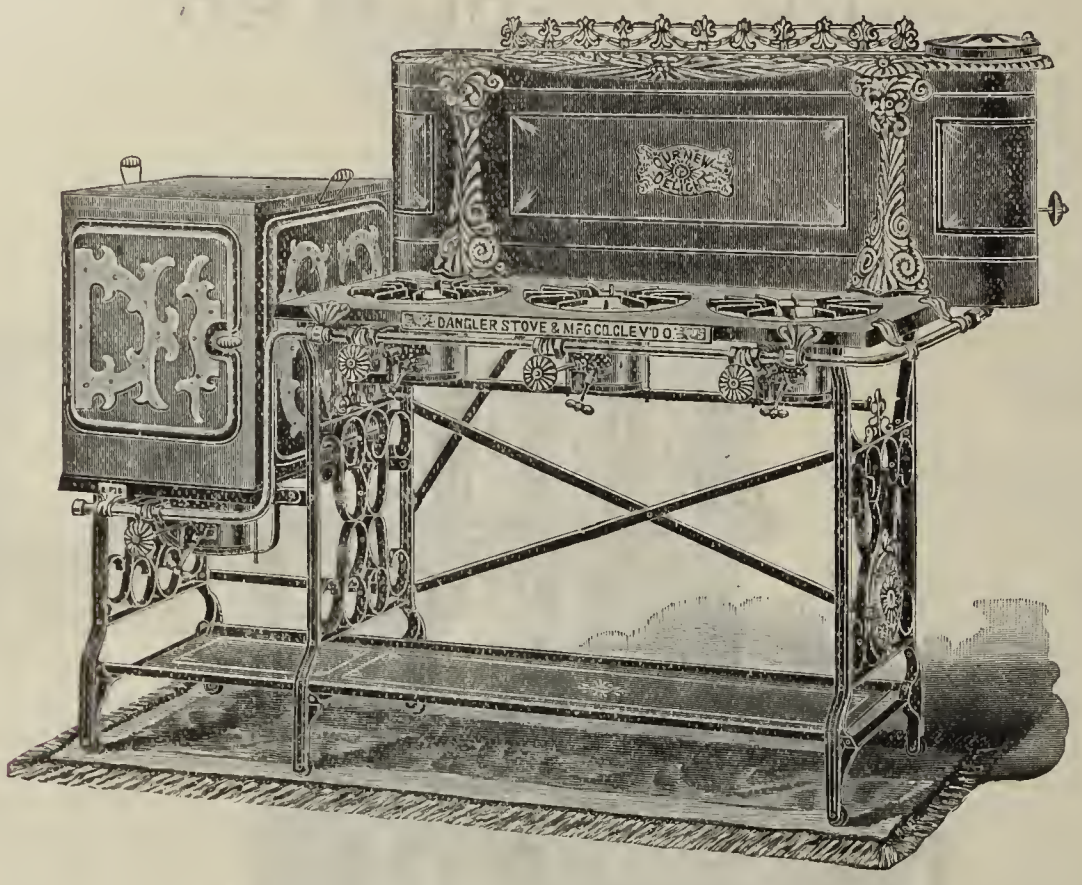
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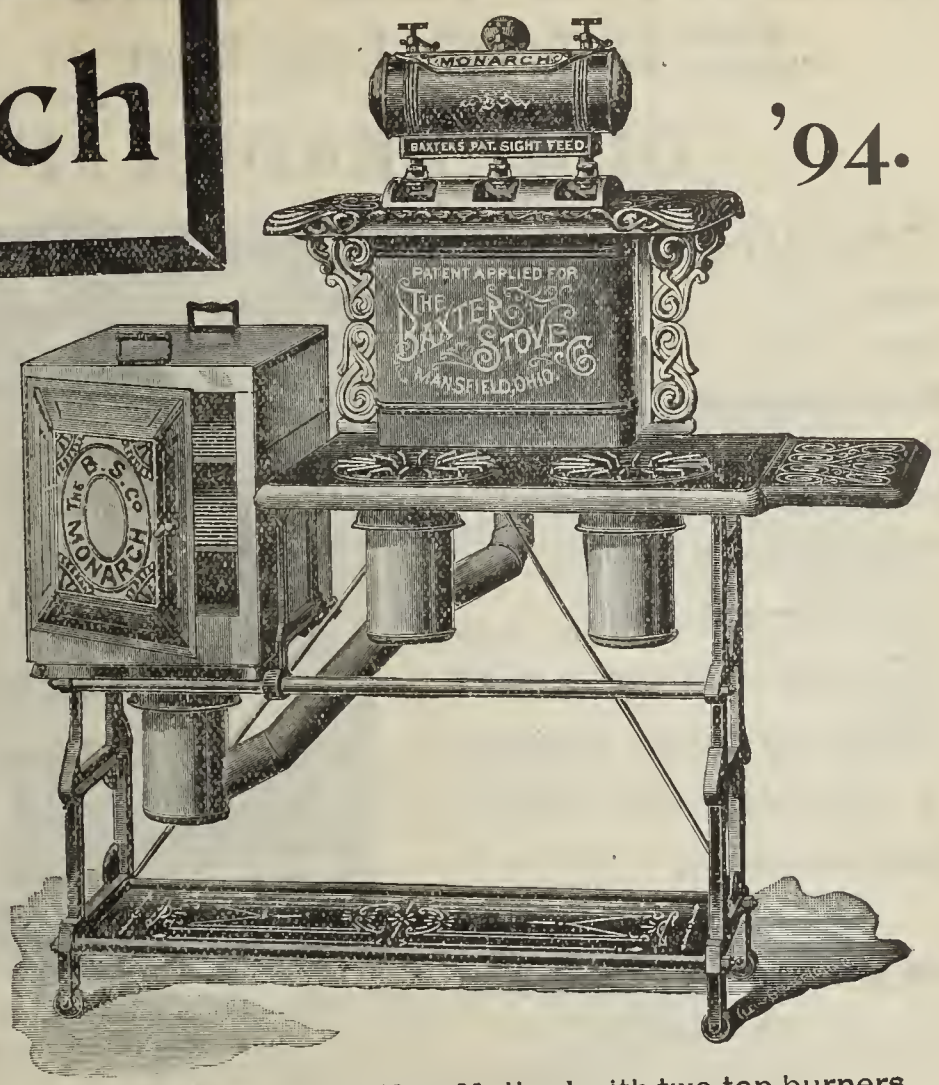
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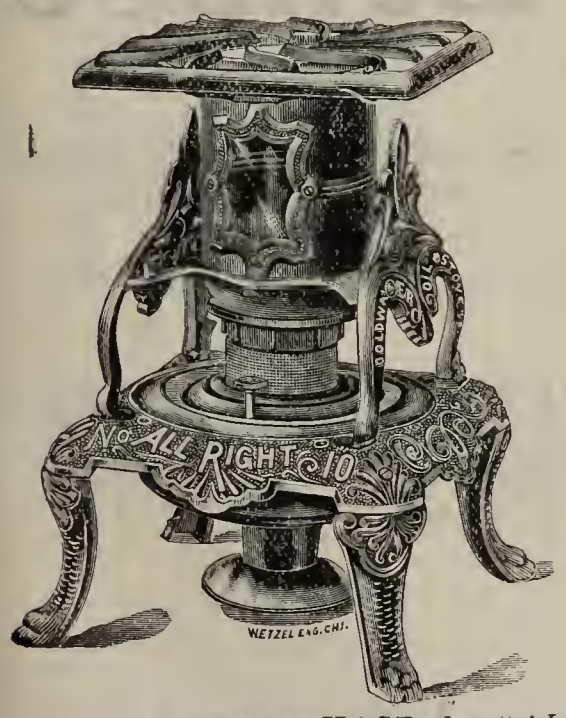
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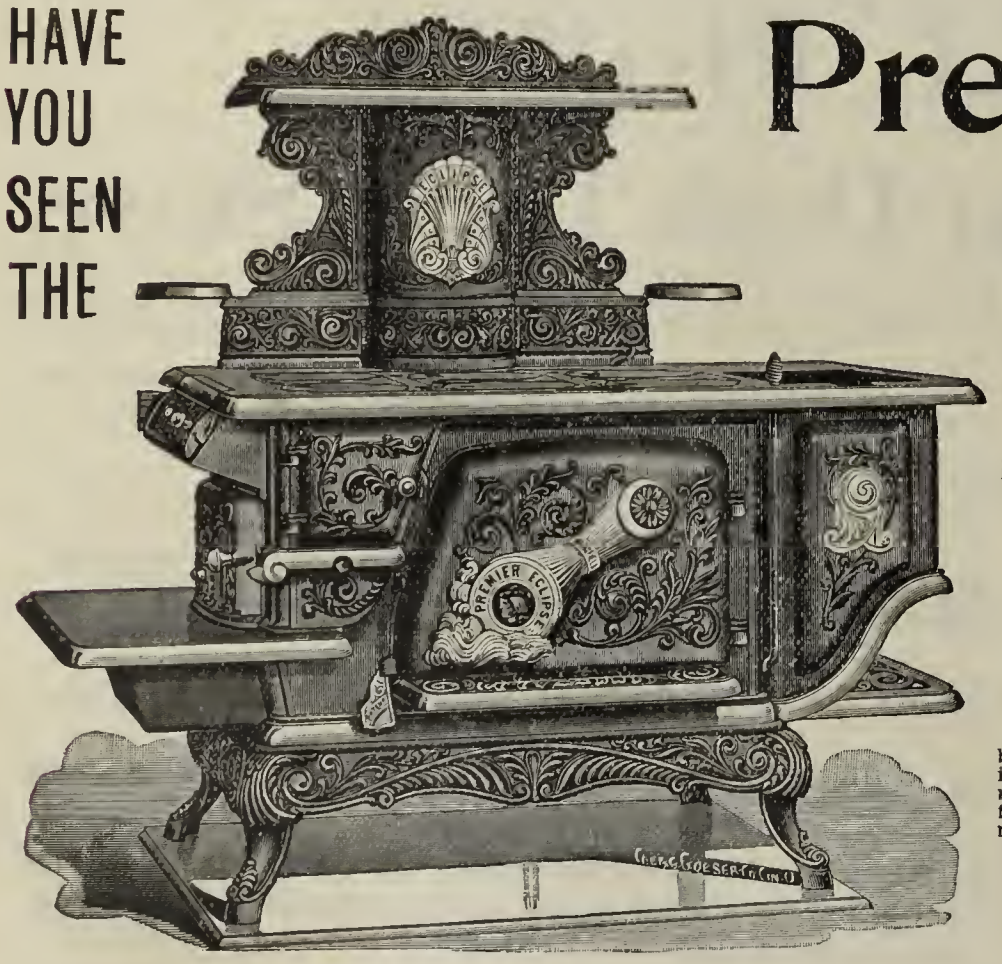
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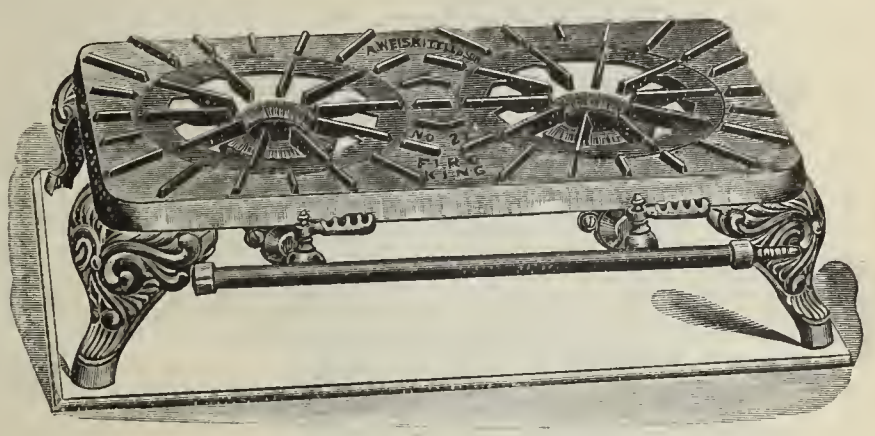
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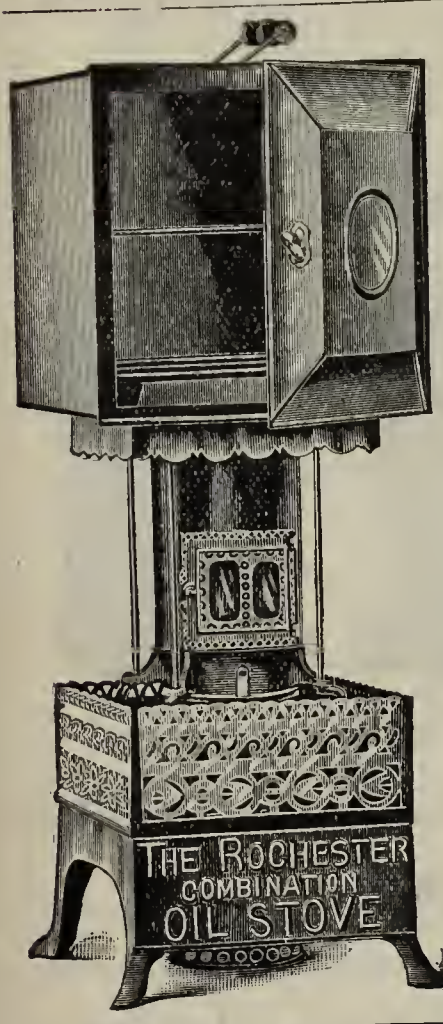


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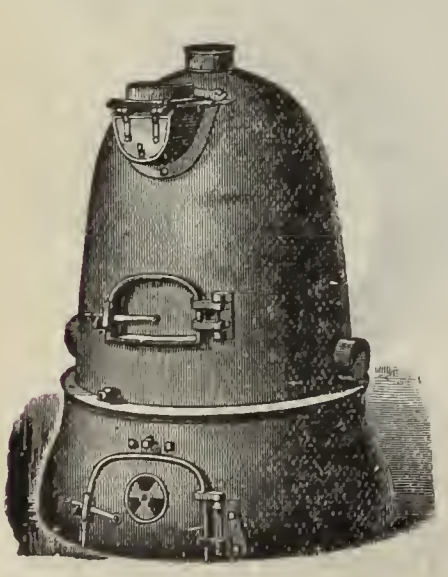


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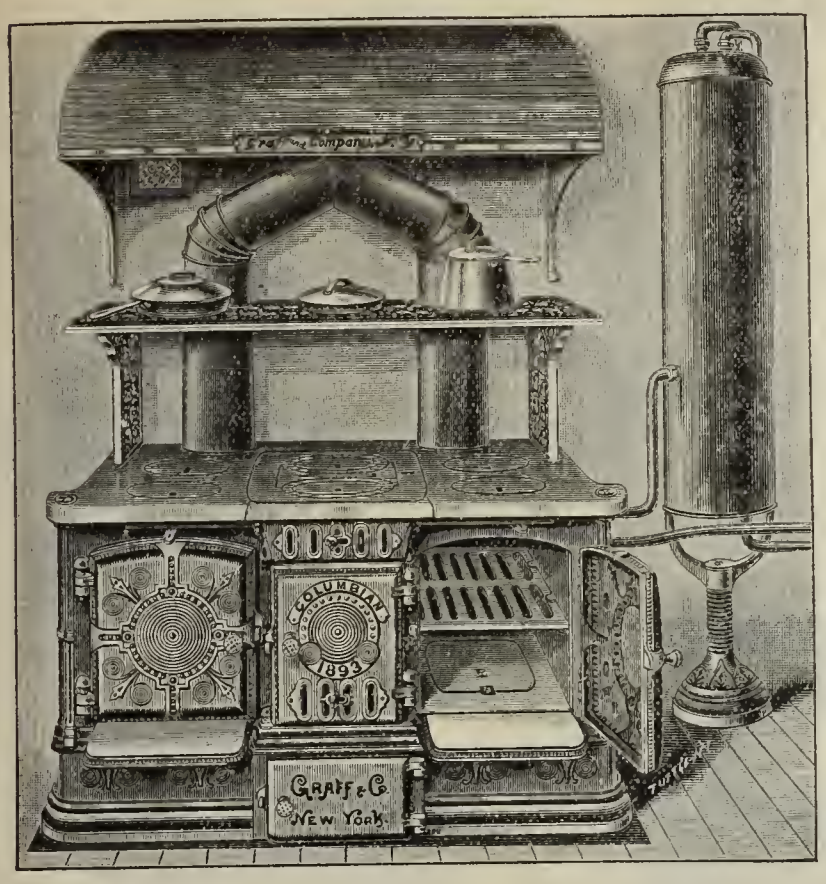
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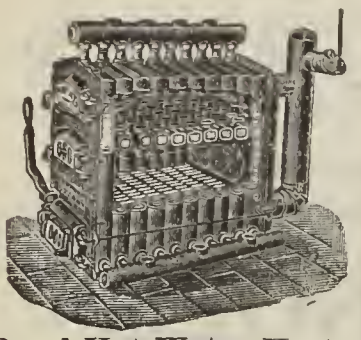
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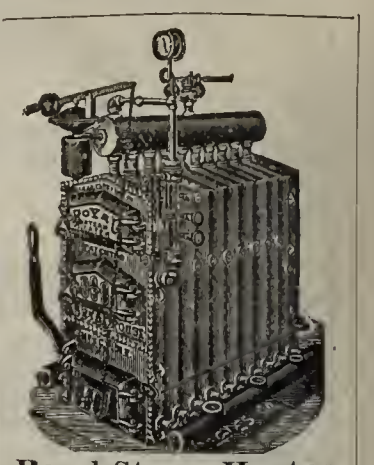


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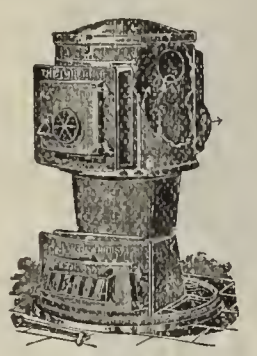
and not on their Antiquity.



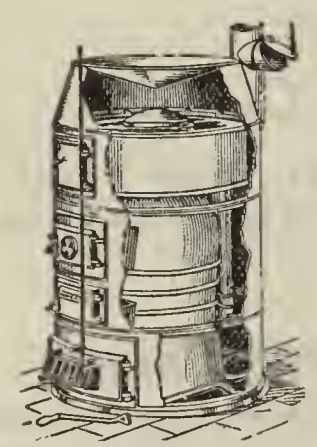
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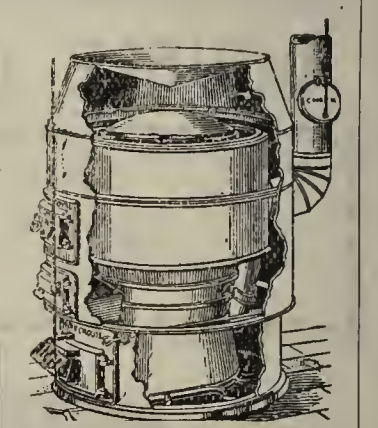
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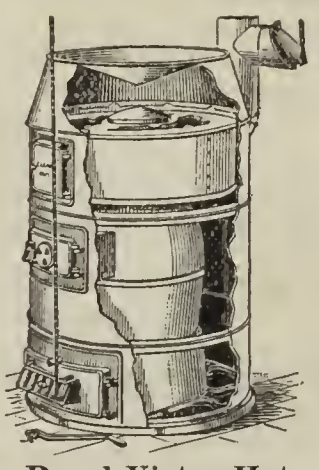


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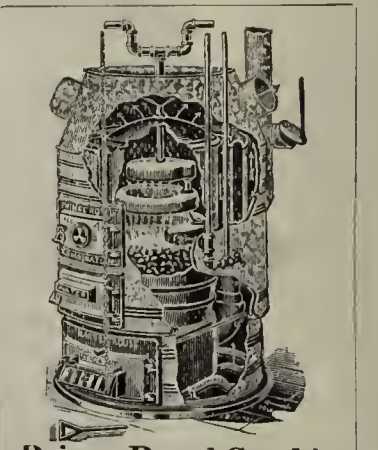


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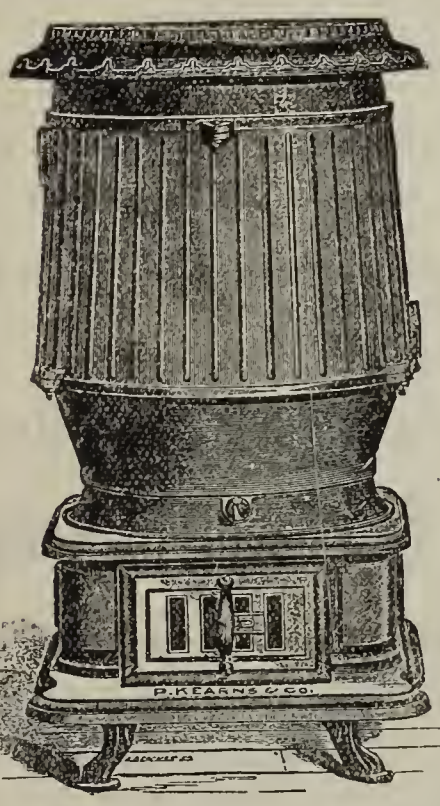
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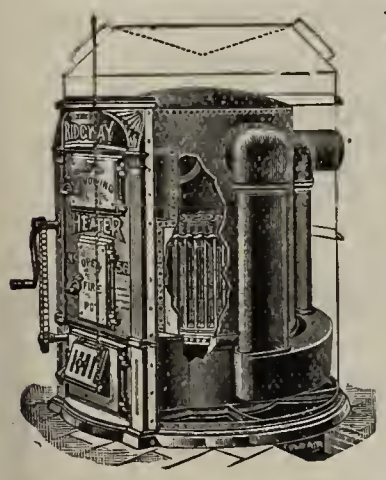
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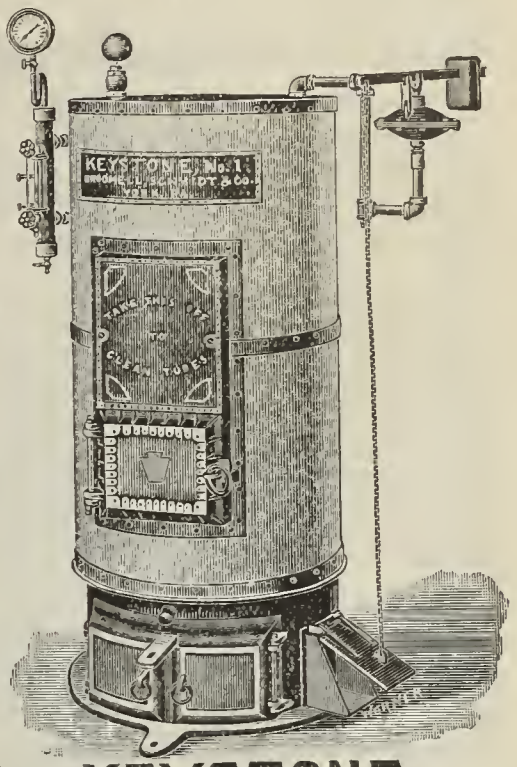
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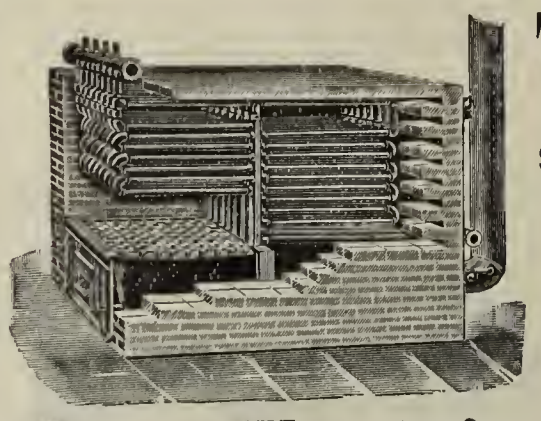
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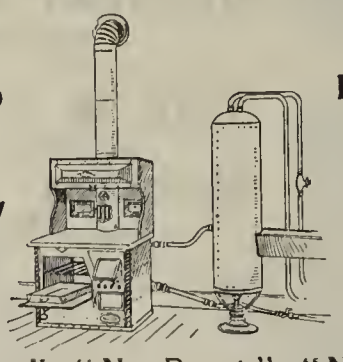
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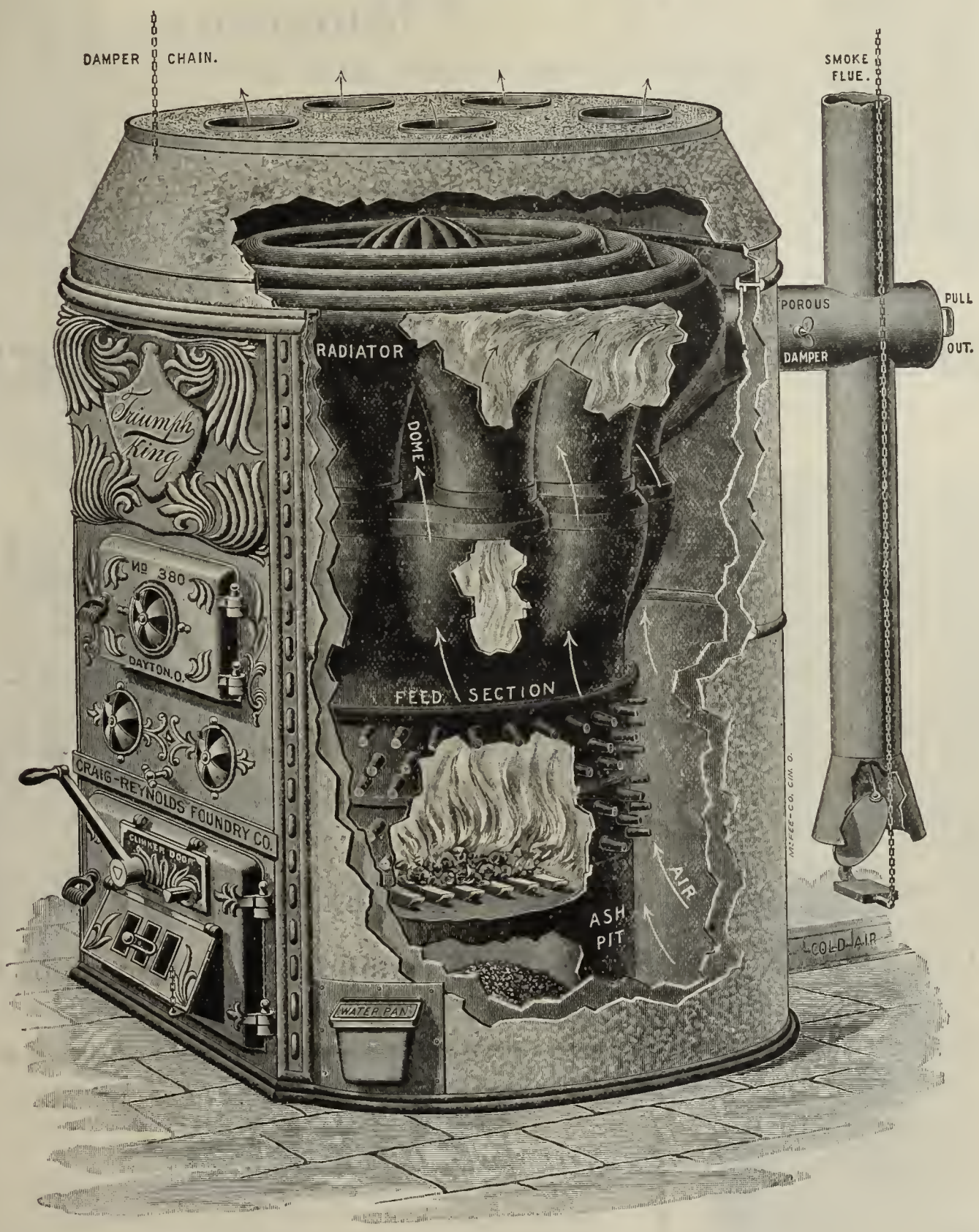
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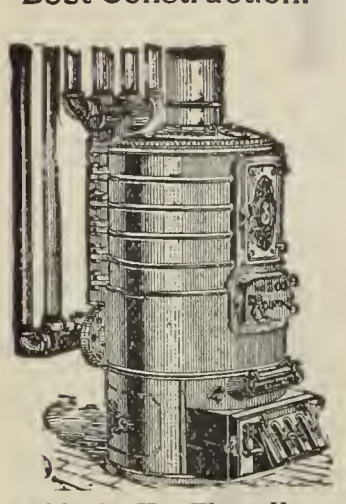
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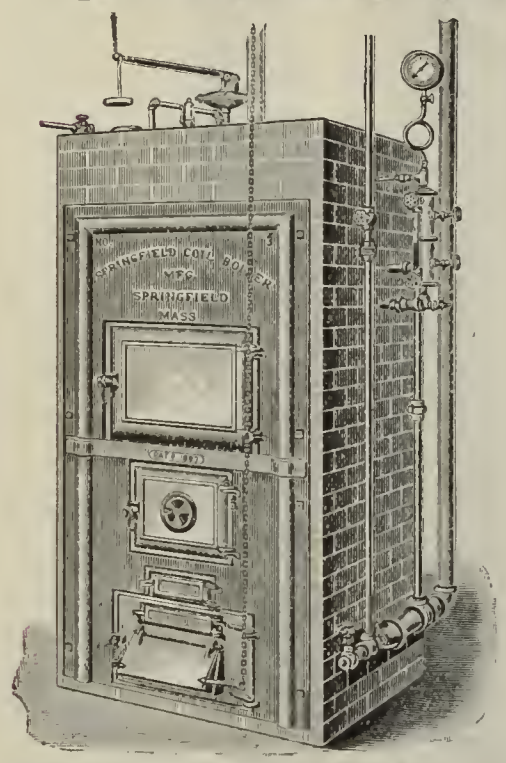
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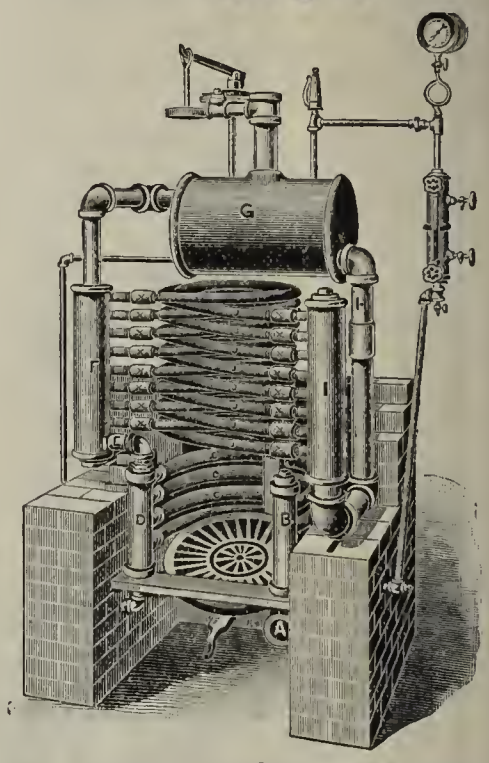


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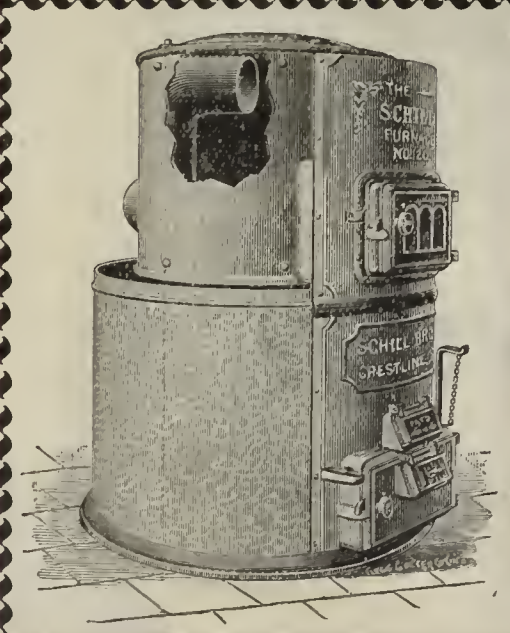
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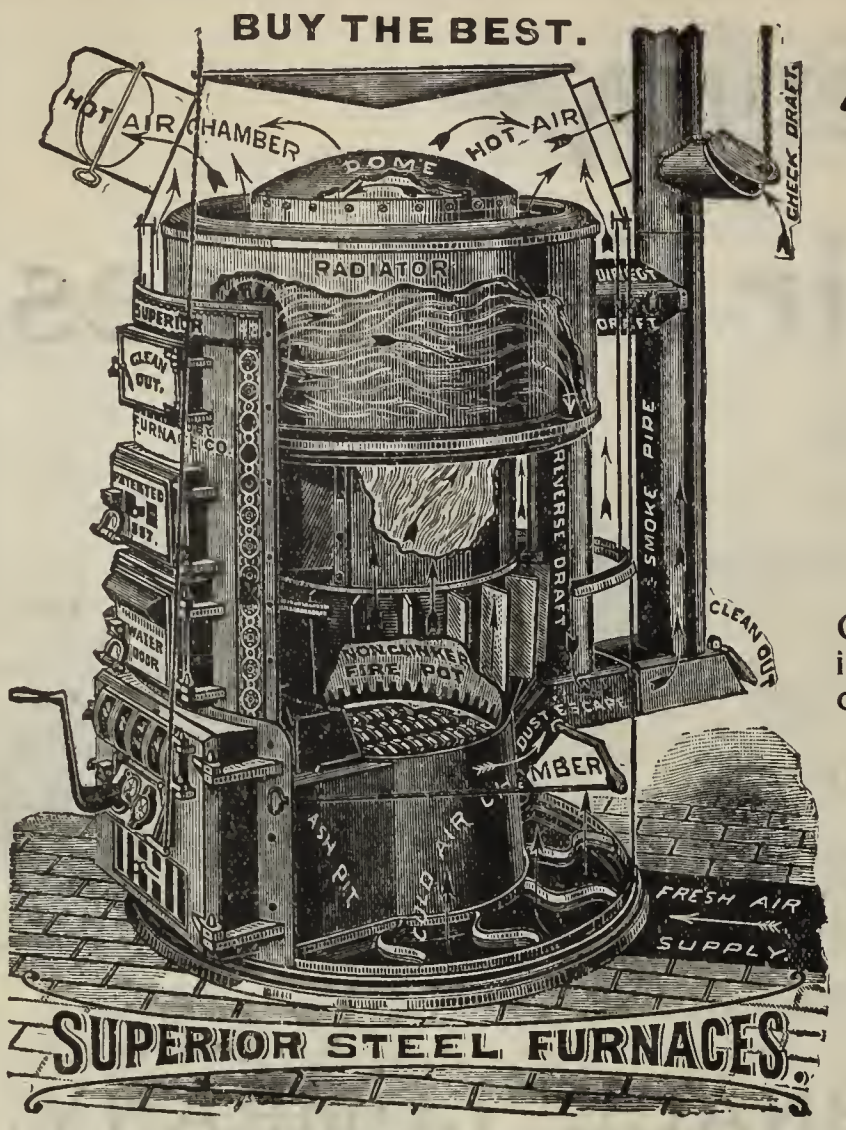
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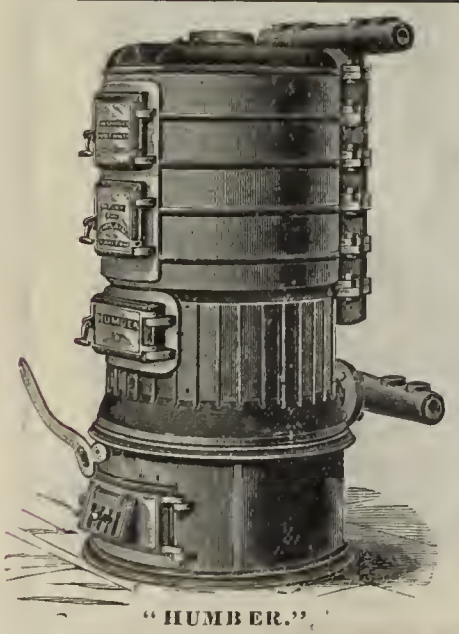
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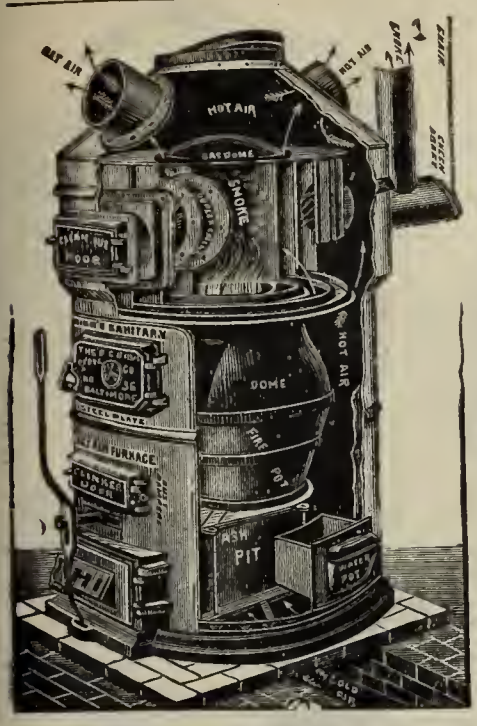
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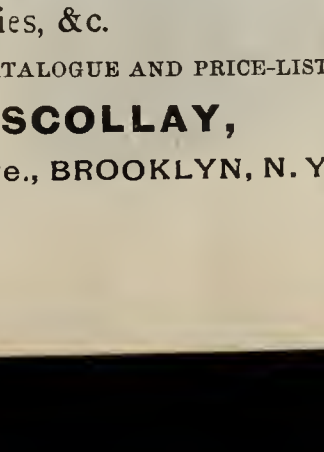
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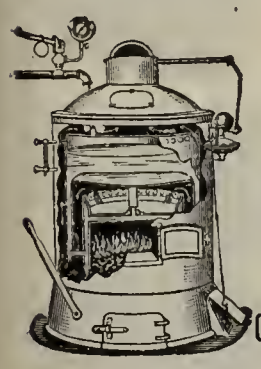
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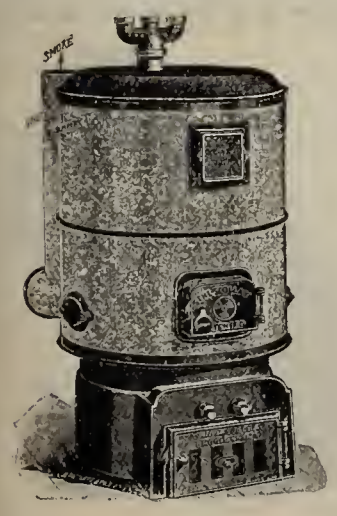


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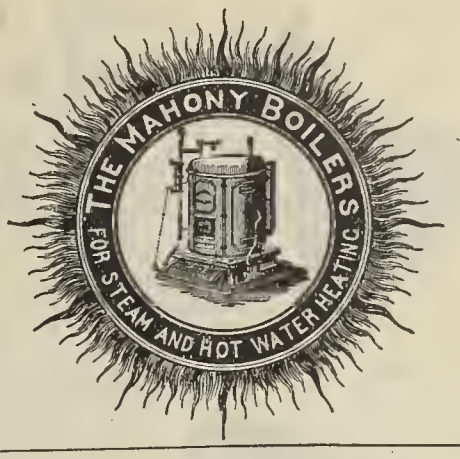
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"Let them steal, then."

"But there is nothing I want them to steal."

He rolled over, growling.

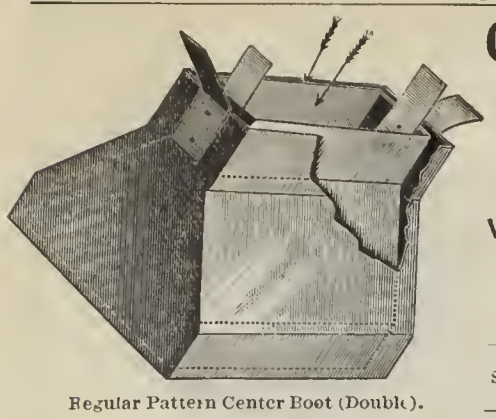
"I suppose," he said, "you would not object if they stole away, would you?"

And that's what they did, probably, for there was no sign of them next morning.

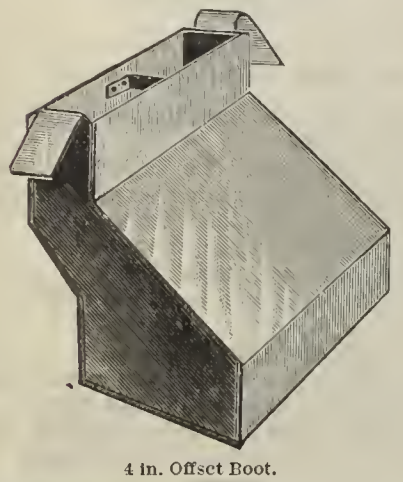
—EDISON AS AN OPERATOR.—"I was an operator in the Memphis office when Thomas A. Edison applied to the manager for a place," said A. G. Rockfeller of the Reminiscence Club, St. Louis. "He came walking into the office one morning looking like a veritable hayseed. He wore a hickory shirt, a pair of butternut trousers tucked into the tops of boots a size too large and guiltless of blacking. 'Where's the boss?' was his query, as he glanced round the office. No one replied at once, and he repeated the question. The manager asked him what he could do for him, and the future great proceeded to strike him for a job. Business was rushing and the office was two men short; so almost any kind of a lightning slinger was welcome. He was assigned to a desk and a fusilade of winks went the rounds, for the jay was put on the St. Louis wire, the hardest in office.

"At this end of the line was an operator who was chain lightning and knew it. Edison had hardly got seated before St. Louis called. The new comer responded and St. Louis started in on a long report, and he pumped it in like a house afire. Edison threw his leg over the arm of his chair, leisurely transferred a wad of spruce gum from his pocket to his mouth, picked up a pen, examined it critically, and started in about 200 words behind. He didn't stay there long, though. St. Louis let out another link of speed, and still another, and the instrument on Edison's table hummed like an old style Singer sewing machine.

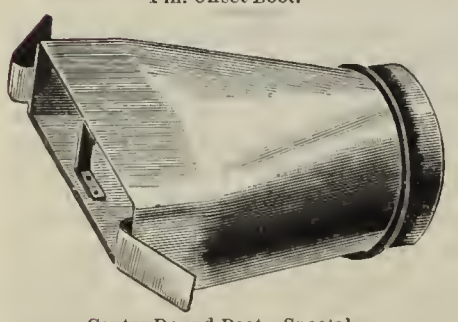
"Every man in the office left his desk and gathered round the jay to see what he was doing with that electric cyclone. Well, sir, he was right on the word, and was putting it down in the prettiest copperplate hand you ever saw, even crossing his t's, dotting his i's, and punctuating with as much care as a man editing telegraph for 'rat' printers. St. Louis got tired by and by and began to slow down. Edison opened the key and said, 'Here! here! this is no primer class! Get a hustle on you!' Well, sir, that broke St. Louis all up. He had been 'rawhiding' Memphis for a long time, and we were terribly sore, and to have a man in our office that could walk all over him made us feel like a man whose horse had won the Derby. I saw the 'Wizard' not long ago. He doesn't wear a hickory shirt nor put his pants in his boots, but he is very far from being a dude yet."



Regular Pattern Center Boot (Double).



4 in. Offset Boot.



Center Round Boot. Special.

Cut Out the Coupon.

Worth One Dollar!

Stacks Require Boots.

We make them! All kinds! All sizes!

IC and IX!

Note Prices on IC.

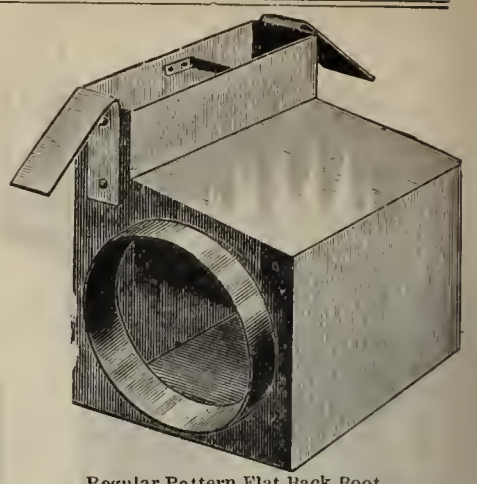
With Bottoms large enough to receive Collars indicated below	SIZES.	KINDS.							
		Flat Back, Regular Pattern.	Flat Back, Special Pattern.	Center Boot, Reg'lr Pattern.	Center Boot, Spec'l Pattern.	Offset Boots, to offset;			
						4 in.	6 in.	8 in.	12 in.
7 inch		30 cents.	30 cts.	30 cts.	30 cts.	55 c.	60 c.	65 c.	75 c.
8 "		33 "	33 "	33 "	33 "	58 c.	63 c.	68 c.	78 c.
9 "		36 "	36 "	36 "	36 "	61 c.	66 c.	71 c.	81 c.
10 "		40 "	40 "	40 "	40 "	64 c.	69 c.	74 c.	84 c.
12 "		50 "	50 "	50 "	50 "	70 c.	75 c.	80 c.	90 c.

IX Goods, 20 per cent advance over above. Double Boots, double list above. This list is net f.o.b. at Chicago on orders of $10 00 or more, with freight allowed between Boston and Omaha on bills paid in 10 days. If you have never used our Boots or Furnace Fittings send coupon and we will credit you with $1.00 on your first order if for $10.00 worth or more of these goods.

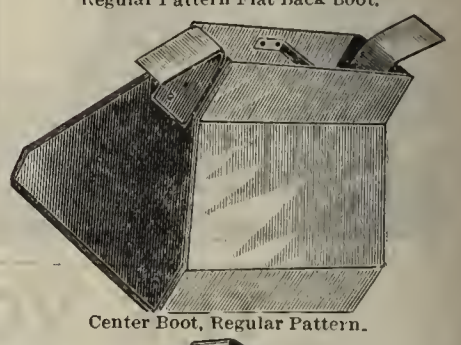
Metal Worker Coupon No. 2. Value $1.00 on first order of Furnace Fittings.

The Excelsior Steel Furnace Co., Chicago

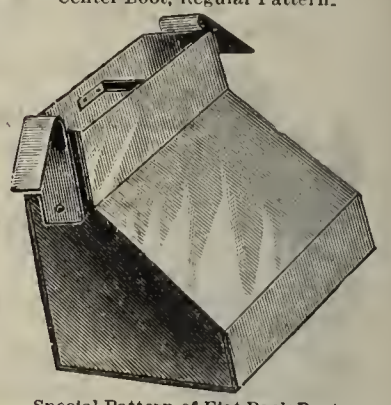
(DUPLICATES VOID.)



Regular Pattern Flat Back Boot.



Center Boot, Regular Pattern.



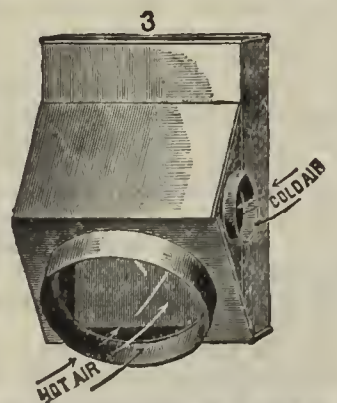
Special Pattern of Flat Back Boot.

Why can't we make a deal with you on Furnace Pipe?

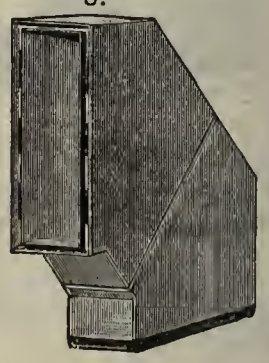
We have the *goods, prices and inclination* to win your trade, and if you'll give us the opportunity will send catalogue descriptive of the first, discounts to prove the second, prompt attention and prompt shipments to verify the third.

You can't help liking our goods, because every furnace dealer who uses them once continues doing so. They can be set in one-quarter of the time required in placing ordinary hand made pipes. Any shape or style of stack can be constructed without using the snips. Every length is double and fitted with slip and socket joint, and is manufactured of the best bright full weight plates. Let us reason with you on the matter, and mail you catalogue, discounts, &c.

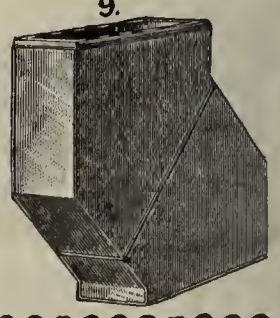
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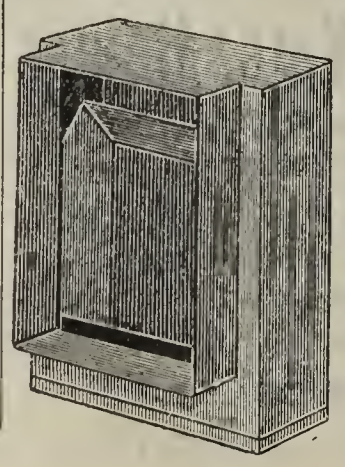


SAFETY FURNACE PIPE CO.,

Nos. 11 & 13 Atwater St., E., - DETROIT, MICH.

Eastern Agents, Riter Bros. & Co., Philadelphia, Pa.





Novelty Ventilated Wall Pipe,

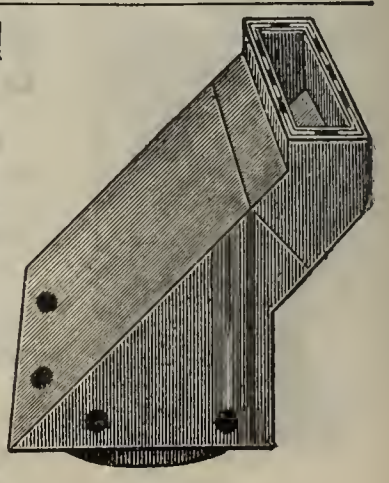
Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from) inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER.

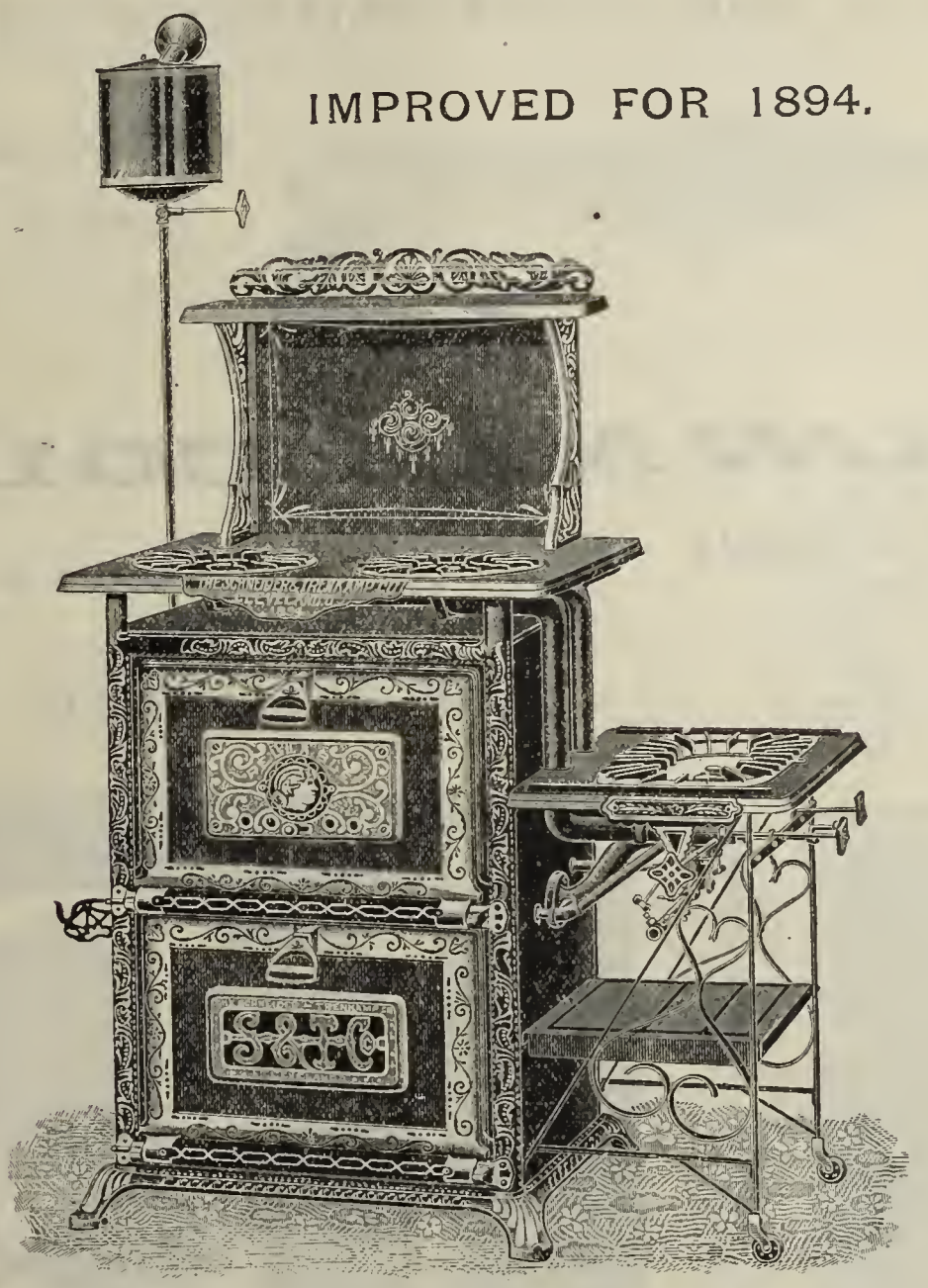
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Gasolene Stoves.

IMPROVED FOR 1894.



If you have not received our NEW ILLUSTRATED CATALOG write for one. We make the largest, most complete line, and make and sell more Gasolene and Gas Stoves than any other concern.

76,807 COMPLETE STOVES SOLD IN 1893.

THE SCHNEIDER & TRENKAMP CO.,

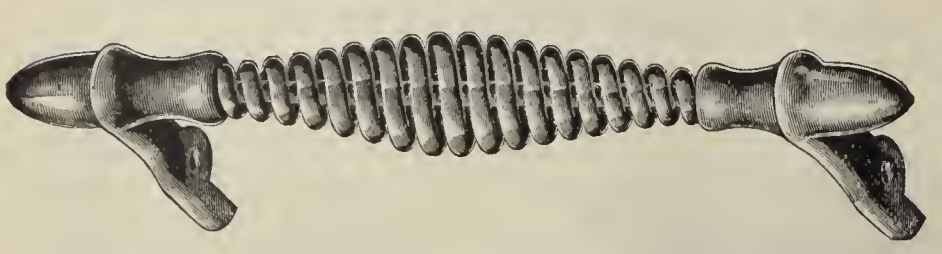
CLEVELAND, OHIO.

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ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota and Montana.
THE H. HALLER MFG. CO., New Orleans, La.—States of Louisiana and Mississippi.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Florida, Georgia, Alabama, Tennessee (excepting Knoxville and Chattanooga) and North and South Carolina.
WIESTER & CO., San Francisco, Cal.—Pacific Coast.
CHAS. F. FOX, Dayton, O.—Central and Western Ohio and Eastern Indiana.
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ALASKA

MADE UNDER THE CAITLEY PATENTS.



STOVE KNOBS AND

HANDLES, TOWEL RODS,

KETTLE BAILS.

ALWAYS COLD.

POKERS, LID LIFTERS, SHOVELS, FIRE SETS.

Are good sellers. Send for prices to Hardware Jobber.

MADE ONLY BY

Troy Nickel Works, Troy, N. Y.



Warm-Air Registers, Ventilators, Etc., Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, Buffalo, N. Y.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers, Ventilators.



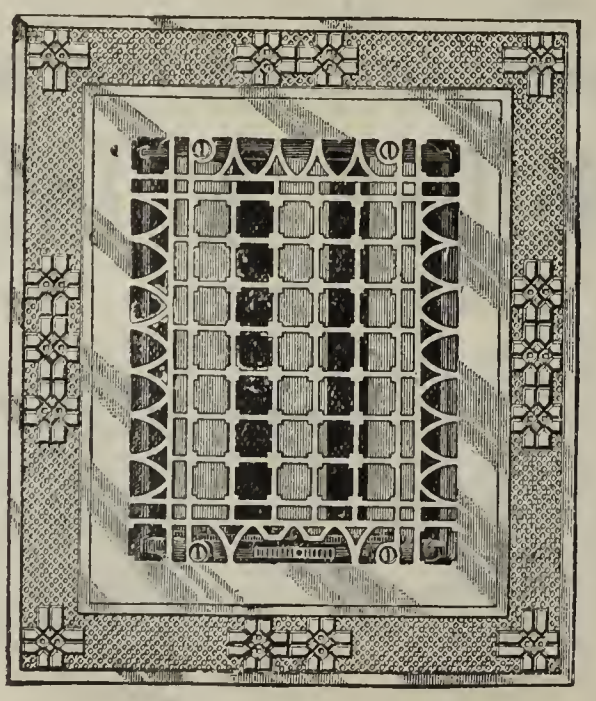
HUB PATTERN.

BOSTON, - - MASS.

—AND—

NASHUA, - - - N. H





Ventilators,

Registers

and Frames.

STRONG, OPEN AND ARTISTIC.

Handsome in any Finish.

THE

Simonds Mfg. Co.,

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Perforated Filter Press Plates.

THE HARRINGTON & KING PERFORATING CO. CHICAGO.



BRONZE SCREEN PLATES To withstand action of ACIDULATED WATERS.

METALS OF ALL KINDS PUNCHED TO ANY SIZE AND THICKNESS REQUIRED

For Coal, Coke, and Ore Separators, Fixed and Movable Screens, Jigs, Trommels, Washers, and Sizers of all kinds.

For Grain Cleaning Machinery, Gas and Water Works, Oil, Flour and Rice Mills, Sugar Houses, Distilleries and Fertilizing Works.

Heavy Steel and Iron Plates and Cylinders for Coal and Coke, Breakers, Ore, Stone, Phosphates & Gravel Screens

Perforated Tin and Brass of all sizes for Oil, Gas and Vapor Stoves, Lamps, Lanterns, Ventilators, Filters, &c.

THE HARRINGTON & KING PERF. CO., Main Office and Works, 224 to 240 N. Union St., Eastern Office, No. 284 Pearl St., New York. Chicago, Ill., U.S.A.



The Boomer is a Success.

Guess which is one of the Leading Furnaces offered for sale to-day.

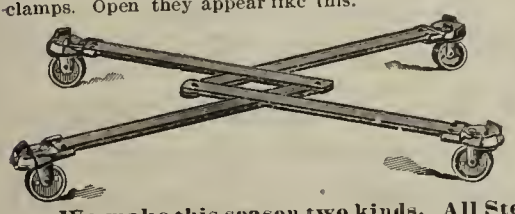
Write for Catalogue, which explains all about the Boomer.

HESS, SNYDER & CO., MANUFACTURERS. Massillon, Ohio.

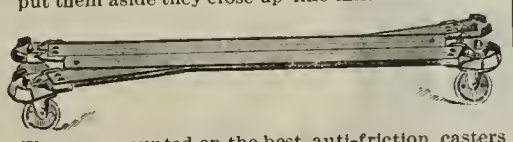


LOCK FRAME STOVE TRUCKS

FIT any stove and hold it secure without the use of nuts, screws, bolts or clamps. Open they appear like this.



But when you are through with them and want to put them aside they close up like this.



They are mounted on the best anti-friction casters and are fully warranted.

We make this season two kinds. All Steel at $18.00 per dozen. Wood and Steel, $15.00 per dozen.

If you have never seen one send for sample at dozen rates.

RANDALL & WARD, Box 49, - - LE ROY, N. Y.

INDIA MICA.

A. O. SCHOONMAKER,
IMPORTER,
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NORTH CAROLINA
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EUGENE MUNSELL & CO.,
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NEW HAMPSHIRE
MICA
IS THE BEST.

The F. E. BELDEN MICA MINING CO.,
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23 and 25 Randolph Street.

ALL KINDS AND SIZES.
WRITE FOR PRICES TO
PALERMO MICA CO.,
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27 PECK SLIP, NEW YORK.
S. T. PECKHAM, Sales Manager.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to
The Mica Mfg. Co.
JOHN O'NEILL, Propr.,
89 Fulton St., N. Y.



Looked at Squarely, and from an Economical Standpoint,

Hodge's Duplex Damper

SHOULD BE USED ON EVERY

Stove, Range, Furnace, Heater and Boiler,

as they hold the heat back, retaining it just where it is wanted, with no smoke or gas in the room, saving 25 per cent in fuel.

SEND FOR CIRCULARS.

HODGE BROS., 13 Chardon St., Boston, Mass.

—"I HAVE called four times to see that man," said the detective indignantly, "and each time they told me he was not in. And yet the mocking world goes on saying that we never find anything out."—*Washington Star.*

—VERY LIKELY.—The Wife: "Is the tariff on canvas to be reduced, John?"

The Husband: "I guess so. They're reducing it or taking it off most everything."

The Wife: "Then we ought to be able to afford a canvasback duck occasionally after the bill goes into operation."



No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8½ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

Dealers who Handle B. & B. STOVES

Make Money at Both Ends.

There are no old relics or fossils in the B. & B. line.

B. & B. STOVES ARE ALWAYS AHEAD.

Our competitors try to imitate, but the race is too rapid for them.



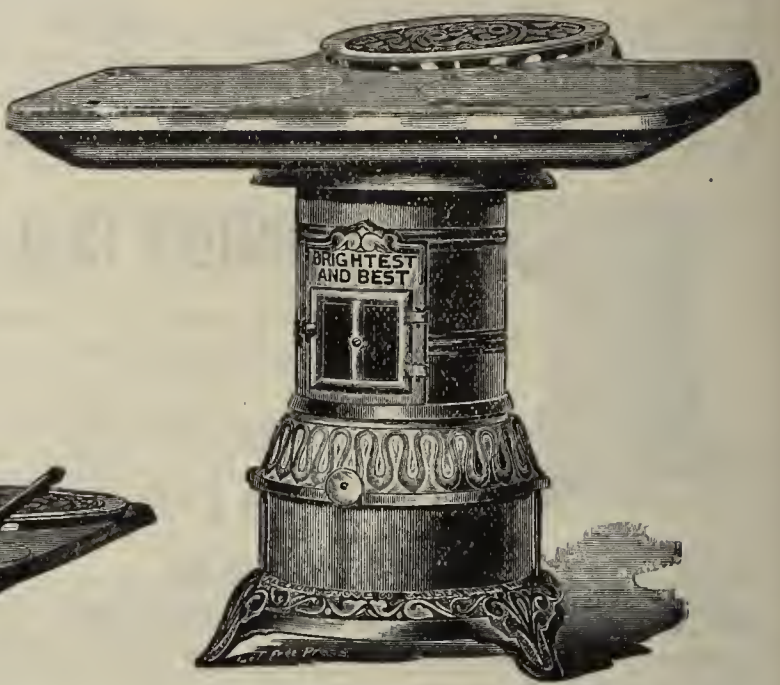
No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozen in box. Weight, 85 pounds. Height, 8½ inches. Size of Tank, 5½x5¾. NICKEL FRONT. Two 4-inch wicks.



No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozen. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8½ inches. Size of Tank, 5½ x 8½ inches. NICKEL FRONT. Three 4-inch wicks.



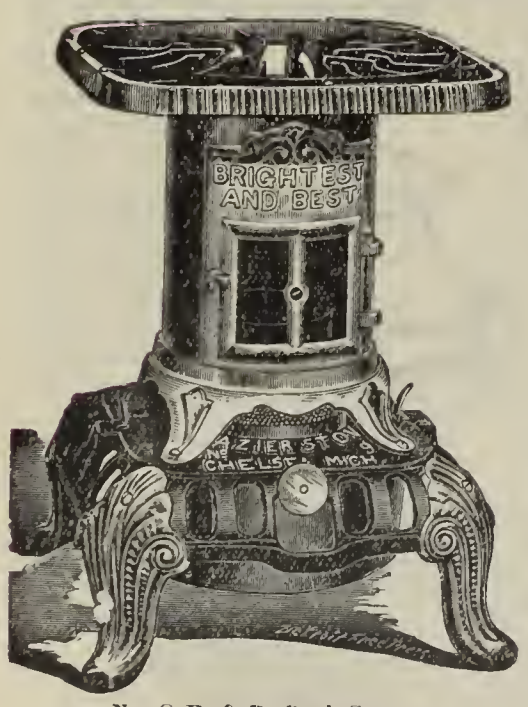
No. 6–3 B. & B. Cook Stove.

Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.



No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.



No. 8 B. & B. Cook Stove.

Nickel Finish. List Price, $3.50. 7½ inch double thick circular wick.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**

It will pay you to consider these points.

We Are After Your Trade.

You will always find the B. & B. Stoves up to date in every particular.

You cannot spend a little time more profitably than in looking over our 80-page catalogue. Ask for one, with discounts.

Simmons Hardware Co., St. Louis,	General	Southwestern Agents.
Hibbard, Spencer, Bartlett & Co., Chicago,	"	Northwestern "
W. W. Montague & Co., San Francisco,	"	Pacific Coast "
Prescott Brothers, Boston,	"	New England "
Bindley Hardware Co., Pittsburgh,	"	Eastern "

THE GLAZIER STOVE CO., Manufacturers, CHELSEA, MICH.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, May 5, 1894.

DAVID WILLIAMS, - PUBLISHER

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ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Index to Reading Matter.....Page 32.

A Word About Valves.

Nothing is more essential to successful steam and hot water heating work than reliable valves. Unfortunately, the intense competition for heating contracts of late years has fostered a disposition on the part of contractors to buy everything of the cheapest; and thus has been created a demand for cheap valves. Now it is a fact that a good valve cannot be produced within a certain limit of cost, and if this line be passed, the quality of the article, while it may suffice for a brief period of use, is sure to give no end of trouble long before a good valve should manifest any symptoms of failure. For instance, a pair of new valves fitted to a steam radiator last fall, though receiving no extraordinary usage, now leak so badly that, when closed, the radiator fills with water and when steam is let on the radiator becomes a "thunder box." The best valves obtainable still have some defects that it would be desirable to remove; the cheaper, poorer varieties are, many of them, all defects.

Weight in Valves.

If a valve body be cast too light it springs easily, and pressure on the seat when closing it causes the seat to yield permanently; it will then leak till the faces of both disk and seat are again ground to fit and will soon give way again in use. A brass globe valve used in a brewery burst by freezing not long ago. Examination of the structure showed so little thickness in the walls of the globe as to render it surprising that it could have been cast so thin. Inquiry disclosed the fact that the valve had leaked almost from the beginning of its use; and doubtless this was expected by the makers, who presumably know enough about valves to understand what has been said above, and who would justify themselves for making inferior goods by the assertion that they would not make them from choice, and do so only because the trade has set up a demand for them. The excuse is valid. Manufacturers must meet the demands of their trade or go out of business.

Can a Hard Seat Valve Close Tight?

There are steam heating engineers who assert that all hard seated valves will leak a little, no matter how well made, unless, after the first closing, they are tightened down again when the stems have cooled. That in cooling after closing the contraction of the stems relieves the pressure of a valve disk upon its seat is certain; whether this is sufficient to slightly open the valve depends probably somewhat upon the elasticity of the material. If the elasticity be sufficient to compensate for the contraction the valve should remain tight; but it would be a very nice job to so relate the elasticity to the contraction as to absolutely insure that a hard seat valve shall remain perfectly tight with once closing. The rule is probably, as the engineers referred to assert, that hard seat valves cannot be relied upon to remain absolutely tight. But the fact is that before the era of cheap valves those with hard seats did give reasonably good service.

Procrastination.

Business and manufacturing houses, like men, have their characteristics, their vices and their virtues. Generally these can be traced to the managing man and his character found reflected in all the actions of the concern as a corporate body. But frequently, through years of continuance in certain methods and customs, the entire establishment becomes saturated with the spirit of him who governs, and remains so long after his departure, notwithstanding the earnest efforts of his successors to turn it from its course. Procrastination, that everlasting habit of putting off things until some other time, whereby everything is always just so far behind, stands out as prominent in many a concern as it does in a multitude of men. The delay of the cobbler and the tailor we somehow take as a matter of course, but the otherwise reputable concern that delays and exasperates us in the greater things of life we frequently set down as unworthy of confidence and our further patronage. The strange thing about procrastination is that it seems only necessary to catch up once for all and then orders would continue thereafter to be filled on time. But the habit once formed is not so easily conquered, and the concern is soon back in the old rut again. Some managers appear to work on the principle that it is best to be just a little behind time, so that there may be urgent cause for rushing the men and thereby getting more work out of them. It takes but a short time and a very moderate intellect to see through the game, however, and therefore the workman's actions are governed accordingly. The waste of material through haste, the poorer resulting workmanship, the additional cost of explanatory letters and telegrams or the time spent in making personal apologies for delay, go far to show the disastrous financial effects of procrastination. The habit will be hard to break and rules will be difficult to follow, but success will attend only when—1. No promises are made that cannot be fulfilled. 2. A sufficient stock of material is kept on hand or the same is ordered promptly enough to cause no delay for lack of it. 3. One thing at a time is completely finished, instead of dropping one job to take up another, because of the importunity of a customer. 4. A thing is put out of sight as soon as it is completed. And finally by such careful planning of the work no time is lost; jobs are started in time to be completed at the desired date and a man's abilities are always utilized to the best advantage.

The closing exercises of the evening educational classes of the Young Men's Institute were held on the evening of May 1 in the lecture room of the institute, 222 Bowery, New York. The Rev. Dr. MacArthur delivered the address of the evening, in which he urged the students to be ambitious and keep up their good work. Forty-six diplomas were awarded, and certificates of progress were given to 23 scholars. The presentation of prizes and diplomas was made by W. M. Kingsley, who presided. Prizes were given for efficiency in arithmetic, freehand and mechanical drawing, shorthand, steam engineering and electricity, &c.

A decision affecting nearly every railroad in the country using steam heating in passenger cars was recently handed down by Judge Swan of the United States Court at Detroit against the Michigan Central Railroad. The decision sustains a patent granted to E. D. Cody in 1885, and owned by the Consolidated Car Heating Company of Albany, N. Y., on a system of car heating. It holds as an infringement the heating system known as the Martin apparatus, now used by the railroad referred to. The decree grants an injunction against the further use of such steam heaters.

The Madrid correspondent of *Industries and Iron* says that the price of petroleum has been raised lately in Spain to such a point that those who previously used the oil for lighting purposes are now employing electricity.

THE LETTER BOX.

Check Dampers.

From C. E. S., *Clinton, Iowa.*—I would like to hear from the readers of the paper in reference to check dampers used in the smoke pipes of different kinds of heaters. There are two kinds primarily—the first simply turns into the pipe and stops or retards the passage of the products of combustion; the other leaves an opening in the pipe through which the chimney is supplied with air, and stops its draft on the fire. A third kind is a combination of both of the above features, opening into the pipe, partially shutting off the passage and also permitting air to enter to cool the pipe and supply the chimney. The second style of damper mentioned cools the pipe much more than the first, and it is said that there is no loss or waste of heat going up the chimney. Is this true? Do these dampers hold the heat in the heater or do they make the fire slow? It is true that with this method the pipe cools, but is it not caused by the cold air entering? What is the best damper? Is there any difference, and if so, why? Where is the best place to put a furnace damper, next to the heater or next to the chimney? These are questions which are only partly decided in my mind, and I think a discussion of them would be interesting to other readers than myself.

Defective Draft.

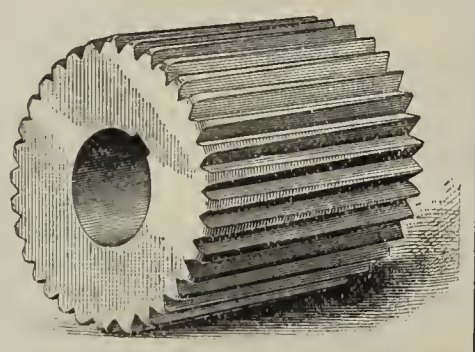
From W. S., *Danville, N. Y.*—I would be glad to receive suggestions from *The Metal Worker* and its readers as to what causes the trouble in two faulty chimneys that are here described: The first chimney is 4 x 12 inches in size and has two stoves connected with it, one pipe hole being 18 inches above the other, the stoves being placed on opposite sides of the chimney in different rooms. The stove which is connected at the lowest opening has a very poor draft, while the one at the highest point has a fair draft. The chimney creosotes so badly that it runs down on the outside of the stack on to the roof and spoils the water which is used for laundry purposes. The chimney is increased in hight by a 7-inch stack, which runs up several feet higher than any of the surrounding buildings. The fault is not with the lower stove, as it worked perfectly when connected with another chimney.

The other chimney has but one stove connected with it, but it creosotes much more than the first chimney. It runs down into the smoke pipe and forms a crust that eats up the pipe in from four to six months. The stove is connected to the chimney by the use of two 45° elbows, so as to give the smoke an easy turn, and there are 2 feet of pipe between these two elbows. What puzzles me is that everything worked first-rate for the last eight years, or up to within a year ago, when the trouble began. The chimney is as high as any of the surrounding buildings, but there are several trees in front of the house, 25 feet from the chimney and possibly 10 feet taller. I shall be greatly obliged for suggestions, and hope some of the readers will give me a pointer or two.

Note.—We trust our readers will discuss this subject. It would seem to us that the first chimney was entirely too small and of a wrong shape to do good work, particularly with two stoves, and from the fact that the smoke cannot get up the chimney fast enough it condenses on the sides of the chimney and makes the trouble reported. The dimensions of the second chimney are not given, but a consideration that would be likely to affect both chimneys is the eating out of the lime in the mortar which cements the brick work, when air would enter to interfere with the draft.

Home Made Pipe Crimper.

From B. C. & Co., *Philadelphia.*—This winter, not being very busily engaged, I concluded I could make a stove pipe crimper of my swedging machine, and made two crimping rolls that would fit on the shafts of the machine for the purpose. I made a pattern of sheet zinc, and when I took it to the foundry I showed it to the foreman and finally asked him if he could make two castings that would be perfectly true from that pattern, and then dropped the pattern in his hand; and as he expected some considerable weight, he nearly threw the pattern in my face because it was so light and made an ejaculation of surprise to find that it weighed so little. There were extensions on the pattern for the core prints, and when I received the castings they had a hole through the center, as shown in the sketch. After the castings were received I filed a slot in the pole to fit over the key on the shaft, and left the edges sharp on one end; but at the other end they were ground flat and round, so that the pipe would not be cut by the machine. These are now slipped on the shaft of my swedging machine, and I can crimp stove pipe first rate. The total cost, without counting my time, was less than 60 cents.



Home Made Pipe Crimper.

The Bell Vapor Stove.

From G. P. M., *Boston, Mass*—Will some one please give me the address of the maker of the vapor stove which carries on the tank the name "Bell?"

Copper Gutters for a Round House.

From C. B., *Conneaut, Ohio.*—I am interested in a controversy as to whether or not copper is the best metal to use for gutters and cornice work on slate roofs. I have a job on hand that calls for gutters and flashings of 16-oz. copper. I shall be glad to have the readers of *The Metal Worker* give their experience with the use of copper in this connection. I have seen a job of copper gutter work that was put on a round house in 1882, which was torn off within the past year because of its going to pieces, but I do not know what metal was substituted. Lead has been suggested as a better metal than copper.

Note.—We trust our readers will discuss this subject, which is very interesting. No doubt the gases arising from the locomotives in a round house subject the copper to conditions which are different than those which would exist on an ordinary roof exposure. There are a number of buildings in this country having copper roofs which have been in use for more than 100 years, Christ Church of Philadelphia, which has never been painted, being a case in point. The City Hall in New York City is covered with a copper roof, which was put on in the usual standing seam form and has been in use about 50 years. In both cases copper is used for the roof as well as the gutters, the City Hall being exposed to what might be called a salt atmosphere, while the church is so far inland that it is not exposed to the same climatic effect, although the Delaware River prevents the climate from being dry.

Sheathing for Tin Roof.

From A. P. B., *Central Nassau, N. Y.*—In reply to the inquiry of "B. J. T." in *The Metal Worker* of April 14, with reference to sheathing for tin roofing, would give my experience as follows: I have laid a number of thousand feet of tin with the sheathing 2 inches apart, but would advise that the tin be painted on both sides before laying; then there will be no rust between the sheathing boards. I would suggest that he get prepared tin that is all ready for the roof and would advise him to use 20 x 28 redipped tin.

Why Did the Boiler Collapse?

From ZERO, *Riverhead, N. Y.*—Will *The Metal Worker* please ask its readers to explain what caused a copper range boiler to collapse under the following conditions? It was supplied with water from the town main and was in constant use up to 10 o'clock at night, when, on account of zero weather, the water in the house was shut off over night. In the basement below the

boiler there is a set of soapstone washtubs and a water closet. Hot water is drawn from the boiler for the tubs. After the water was shut off from the water main, the bibbs in the washtubs were opened to allow the water in the pipes to run out in order to prevent freezing. The boiler has a usual delivery tube in the center with a hole in it near the top to prevent syphonic action.

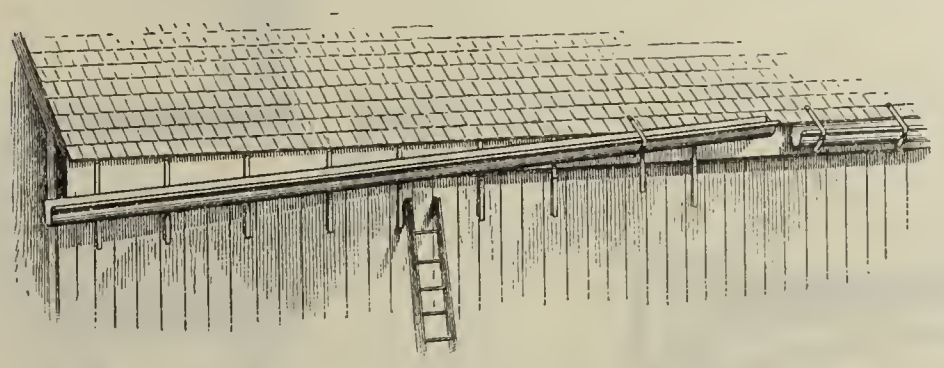
Wants to Learn Brazing.

From A. C. R., *Newark, N. J.*—Plesse let me know through *The Metal Worker* the methods employed in brazing, as followed in railroad repair shops.

Answer.—Too much space would be required to give a comprehensive answer to the questions asked, and we would recommend our correspondent to get a copy of "The Art of Coppersmithing," which can be supplied by the book department of this office.

Hanging Long Gutters.

From O. J. B., *Troy, Ind.*—I send to *The Metal Worker* my method of hanging long gutters and would like to hear from some of my brother tinners on the same subject. Many different styles of eaves are met with, and different styles of gutter and hangers are used. In hanging gutter on a barn 80 feet long I would put up the gutter in two sections of 40 feet each. When the eave projects considerably without any back strip nailed to the end of the rafters, I always have one put up 6 inches or more wide according to the pitch of the gutter. Then I nail my gutter straps to it about 2½ feet apart. I make them out of good tin painted on both sides, and cut them 1 inch wide and 28 inches long. At the center of the strap I rivet or solder another strap half as long to hold the gutter from being lifted up in a wind storm. Having nailed up the straps make a loop of one, as shown in the illustration, about 10 feet from the high end of the gutter, for the work should always commence at the high end. Now place the ladder about 20 feet from the end and pick up a section of the gutter at the middle of the 40 feet and mount the ladder, when if it is not a windy day one end of the gutter can be easily pushed through the loop and the gutter secured by another loop near the ladder. After this, by moving the ladder the other straps can be fastened so as to give the gutter a proper pitch, and the first section is completed. The second section is put up in the same way, and when it is secured the two sections are connected and the straps fastened to maintain a proper pitch through the entire length. When all is securely fastened the open seam between the two sections must be soldered; this completes the work ready for the conductor to be attached to pipe at the low end of the gutter. I sometimes solder the down straps under the bead of the gutter about 10 feet apart, and when properly nailed they hold the gutter securely in place, and the strongest wind will not lift the gutter out of the straps or destroy the pitch.



Hanging Long Gutters.

Fails to Bake on the Bottom.

From H. F., *Chicago.*—I have read the different letters that have appeared in *The Metal Worker* in answer to the inquiry of "W. F.," in the issue of January 20, with considerable interest. Two primary causes for cooking stoves failing to bake are bad fuel and bad management. I have used a large number of stoves during the last 20 years, and have never had any serious trouble in making any stove or range bake on the bottom. There are all kinds of coal on the market and also all kinds of stoves. Very poor fuel is not likely to give satisfaction used in a very cheap stove, and the very best stove made, set up to a good flue, will not work well unless managed properly. Dealers are generally willing to give the instruction necessary for the proper working of a stove, and it is very important that they should do so. I was recently informed by a woman who has a stove that had an excellent reputation that she had used it for three years without cleaning the flues, not even knowing that the flue stop could be removed. Consequently it had failed to give satisfaction, and, to use her own expression, "the stove was good no more." I have used the same kinds of stoves in different chimneys, and have found the stove to work best where the draft was good. From my own experience, I believe that the ranges made by some firms will give better satisfaction than those made by others, and that a well made range of the sheet flue type will cure many faulty chimneys. I always select stoves having full deep flues and an ample fire chamber, and never have any trouble to make them bake on the bottom.

What is a By-Pass?

From A. J. C., *Morristown, N. J.*—Will you please explain in *The Metal Worker* the meaning of a by-pass, as relating to plumbing work? I have read of it quite often, but could never find out the meaning of it.

Answer.—A by-pass is a branch from a main which extends past some fixture and enters the main beyond it. Two stop cocks are placed upon the main between the two by-pass connections, and a branch to some other fixture is taken off between these two stop cocks. When no water is desired in this branch both of the stop cocks on the main are closed and the stop cock in the by-pass connection opened. By this means the water passes by the branch and continues to supply the other fixtures on the main.

Rust Preventive.

From YATES & Co., *Rockford, Ill*—If "A. L. H.," Woburn, Mass., whose letter appeared in *The Metal Worker* April 21, will send us his address we will mail him a pamphlet telling him how to make a rust proof application at 37 cents per gallon, and a first-class paste stove polish at from 3 cents to 6 cents per pound.

OBITUARY.

BIRDSILL HOLLY.

Birdsill Holly, inventor of the Holly system of water works, died at his home in Lockport, N. Y., April 27. He was born in Auburn, Cayuga county, N. Y., October 8, 1820. He received a common school education and then worked at general mechanics and as millwright. After becoming an expert in all kinds of general mechanical work he went to Uniontown, Pa., where he first became superintendent and afterwards proprietor of a large machine shop, which he conducted for a number of years. He then returned to Seneca Falls, N. Y., where he became a member of the manufacturing firm of Silsby, Race & Holly. They produced hydraulic machinery. In 1859 he removed to Lockport, where he resided until his death. He gave his time to the inventions which have made his name far known. He invented a chain stitch sewing machine which had a large sale. He invented and perfected over 150 devices. Some of these in machinery were bought in Europe, where they are now manufactured. But the invention with which his name will always be identified is that of the Holly system of water works. The builders of the systems of engines and pipes, the Holly Mfg. Company, organized in 1859, have now a capital of $1,000,000, employ 500 men, and their works occupy over two blocks in Lockport. They have already placed their system in over 2,000 towns and cities of the United States and Canada, where it is now in successful operation.

The recently enacted anti-monopoly law of the State of Illinois does not appear to operate satisfactorily, if it be true, as stated, that over 15,000 corporations in Illinois have neglected or refused to make a report to the Secretary of State, according to its provisions. About 10,000 only made full reports, while several thousands evaded the law by taking out certificates of dissolution. According to the law the Attorney-General is now bound to bring actions against the 15,000 delinquent concerns, a sufficiently arduous task.

The negotiations for a proposed transatlantic steamship pool have fallen through and will not, it is said, be resumed. A rate war in steerage passenger traffic has been inaugurated between the British and Continental lines of steamers.

THE RETAIL STORE.

The Thomas Hose Nozzle and Sprayer.

The accompanying cuts represent a hose nozzle and sprayer combined, offered by John H. Thomas, Piqua, Ohio.

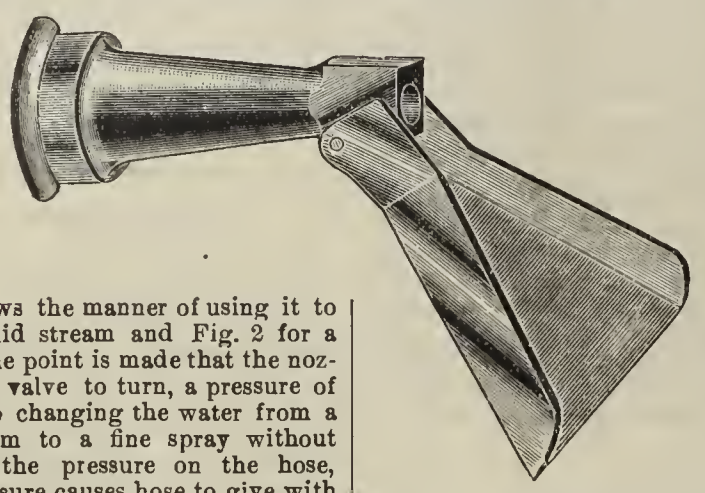


Fig. 1.—The Thomas Hose Nozzle and Sprayer.

Fig. 1 shows the manner of using it to throw a solid stream and Fig. 2 for a spray. The point is made that the nozzle has no valve to turn, a pressure of the thumb changing the water from a solid stream to a fine spray without changing the pressure on the hose, which pressure causes hose to give, with a tendency to collapse. The nozzle is designed for street sprinkling, watering

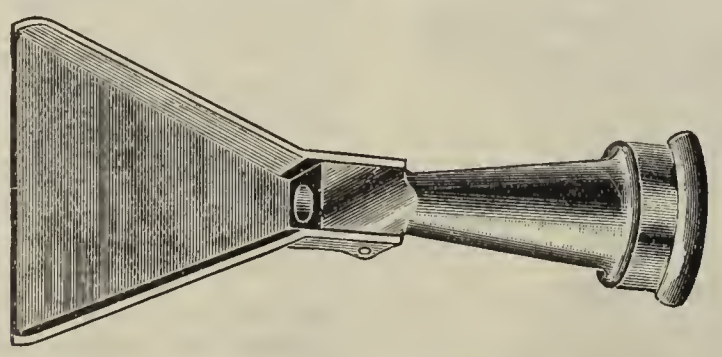
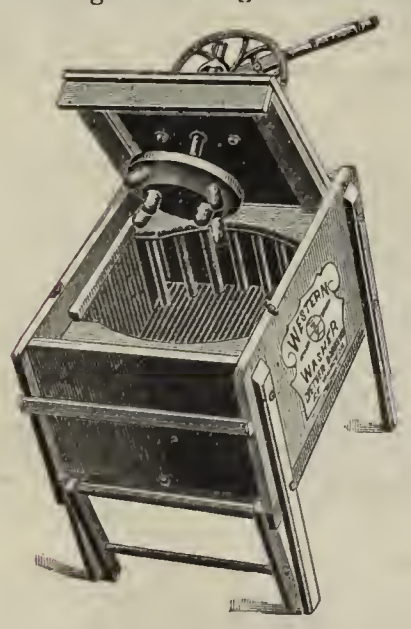


Fig. 2.—Position for Spray.

flowers, lawns, washing buggies, &c., or for any purpose for which a hose is used.

The Western Standard Washer.

Diether & Barrows, Fort Wayne, Ind., are offering the washing machine shown

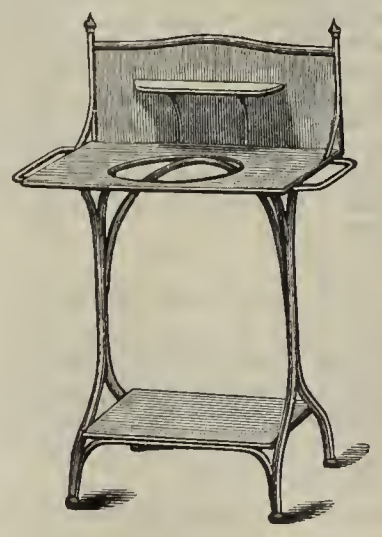


The Western Standard Washer.

in the accompanying cut. An important feature of the machine is a galvanized steel shifting shaft, to which a rubber or pin wheel is attached. The shaft is described as having a free perpendicular movement through the gear wheel, quickly adjusting the rubber or pin wheel to any quantity or condition of the clothing in the washer. The manufacturers claim that the galvanized steel shafts will not shrink, swell, rust, rot, split or break, and that the gearing will adapt itself to a single piece or a tubful, washing any intermediate quantity to perfection. The washers are made in sizes Nos. 2 and 3.

Japanned Toilet Stand.

One of the latest productions in the line of sheet metal furniture is the ja-



Japanned Toilet Stand.

panned square toilet stand, shown in the accompanying illustration. The stand is manufactured by the Lalance & Grosjean Mfg. Company, 19 Cliff street, New York, by whom it has just been placed on the market. Made of sheet steel, the stand is light, yet durable, and is specially adapted for country house or camp use. It is japanned of an ivory white color, resembling enamel, and is easily kept clean, presenting at all times a neat and tidy appearance. It is fitted for the accommodation of all the toilet requisites, and possesses the additional recommendation of economy of space, being but 42 inches high and 30 inches wide.

Hanks' Water Filter.

Bigelow & Dowse Company, Boston, Mass., as exclusive agents for the Hanks Filter Company, are introducing

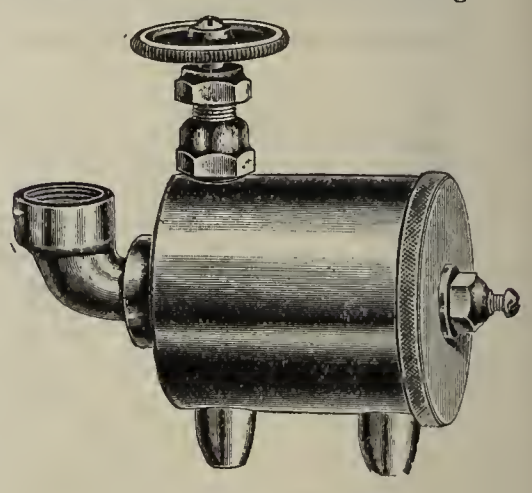


Fig. 1.—Hanks' Water Filter.

the filter shown in the accompanying cuts. The filter is of cast brass, nickel plated, the body being 3 inches long and 3 inches in diameter, and designed to attach directly to the faucet of the water supply pipe. From Fig. 2 it will be seen that the connection with the faucet is made at the elbow, at the left of the cut. To the right of the stop cock is a carbon block, $\frac{7}{8}$ inch thick, which fits the inside walls of the

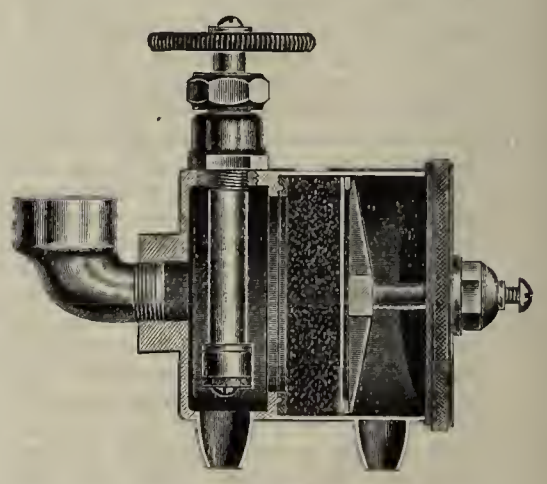


Fig. 2.—Interior of Hanks' Water Filter.

filter closely. This is held closely against the rubber gasket on the flange, by a set screw pressing against a brass spider. Access to the interior of the filter is gained by unscrewing the cap which forms the covering of the right hand end. The position of the carbon, it is explained, is such that it is kept

clean by the water rushing in when the stop cock is raised, the water and dirt thus leaving the filter by the tube immediately beneath the stop cock. To filter the water the stop cock remains closed, and the water is forced through the carbon and out of the other tube. Should the pressure be insufficient to keep the carbon washed clean, it may be removed and the surface cleaned with sand paper. The advantage claimed for the filter is that the filtering surface is easily kept clean, consequently the water is not forced through accumulated filth collected on the filtering surface.

The Matchless Coffee Pot.

Hill & Whitney Mfg. Company, 149 Pearl street, Boston, are offering a coffee pot as shown herewith. It is made with a filter which can be raised or lowered by means of a chain attached to it,

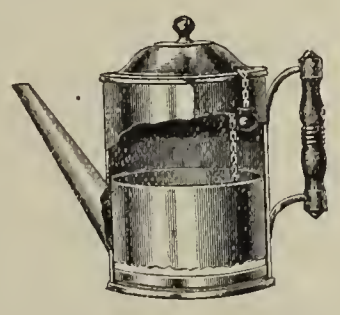


Fig. 1.—The Matchless Coffee Pot.

and which can be removed. For filtering, common unbleached cotton cloth is used, torn or cut in squares about an inch larger than the cylinder bottom, and secured on the bottom of the filter by means of a screw cap. In use the filter is placed at the bottom of the pot as in Fig. 1, into which fine ground coffee is put, and on which is poured the desired quantity of boiling water. After the pot has stood on the stove seven to ten minutes the filter is raised as in Fig. 2, and suspended by catching the hook on the chain over the rim of the pot. As soon as the liquid has passed from

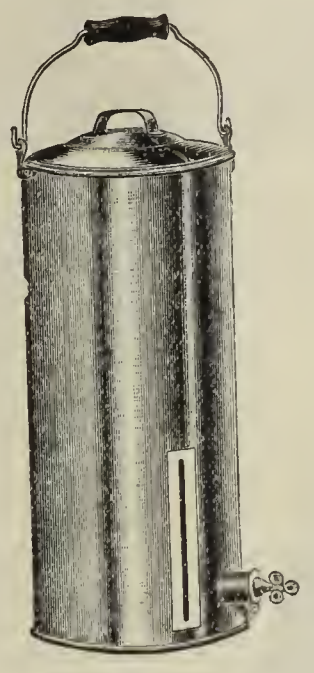


Fig. 2.—Filter in Coffee Pot Raised.

the filter, which requires two or three minutes, the coffee is considered ready for use. The advantages claimed for the process of first steeping and then filtering the coffee are as follows: That the grounds and water are quickly and perfectly combined and remain together steeping as long as is desired ; that in the use of a filter practically of as large an area as the pot a close texture of cloth can be used, permitting the use of fine ground coffee, resulting in economy of time and material and the production of a clear extract, and that by daily renewals of the filter at a cost of from $\frac{1}{2}$ to $\frac{1}{8}$ cent for each cloth, a uniform and excellent beverage is always obtained, free from all disagreeable taint. The manufacturers state that the pot is also especially adapted to making tea.

Maine Creamery Can.

Portland Tinware Company, Portland, Maine, are offering the creamery can shown here. It is referred to as being made of the best quality of tin, extra heavy, well made, and is provided with a glass gauge and metal faucet. The



Maine Creamery Can.

faucet is set 1 inch from the bottom, to allow the milk to be drawn off until the cream is reached, then to draw off the cream, leaving an inch of milk in the bottom of the can with the sediment undisturbed. The can has been put on the market to take the place of a high priced can.

Central Filter Cooler.

The Central Stamping Company, 23–25 Cliff street, New York, are offering the Central filter cooler, as shown in Figs. 1 and 2. Fig. 1 represents the filter in position. Fig. 2 shows the filter cylinder detached. The cylinders are made of galvanized iron and fitted with a carbon block filter, so arranged as to be easily removed for cleaning.

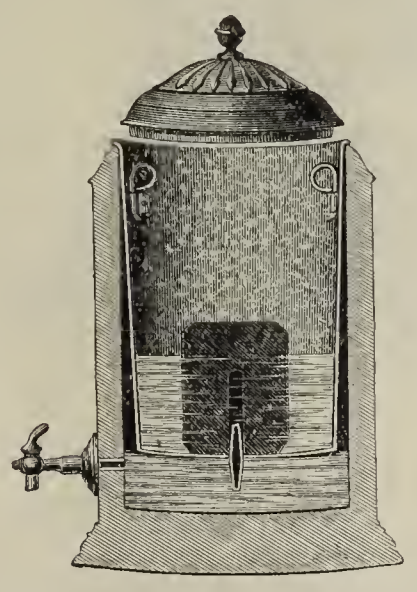


Fig. 1.—Sectional View of Cooler, Showing Filter in Position.

The ice and water are put into the cylinder, filtering through the carbon and tube into the cooler, to be drawn off through the faucet at will. The prominence given to purer drinking water by specialists of late years as a means of avoiding disease has stimulated the production of many forms of filtering apparatus more or less expensive. The filter here shown has been devised to

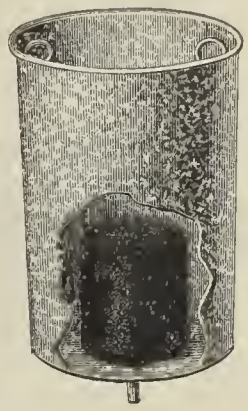


Fig. 2.—Showing Filter Detached.

accomplish the result sought at comparatively slight expense. The cylinders are made in seven sizes, from 2 to 14 gallons capacity, and will fit any of this company's regular coolers.

Screw Cup Dinner Pail.

The accompanying cut represents a dinner pail with a screw cup offered by W. B. Bertels, Son & Co., 186 East Market street, Wilkes-Barre Pa. The opening at the top of the coffee can is large enough to admit of the hand for easy cleaning, and the manufacturers claim that the coffee cannot leak or slop out when the cup is screwed on. The ears are provided with springs for holding the coffee can in place. The manu-



Screw Cup Dinner Pail.

facturers state that the material and workmanship are good, that the design of the pail is attractive, and that the coffee can is large. The pails are made in three sizes : small, medium and large.

Buckeye Pruning Shear.

The Peck, Stow & Wilcox Company, 27 Chambers street, New York, have improved their French pattern pruning shear by substituting a volute for the coil spring. The volute spring is made of a spiral scroll of steel plate extended in the direction of the axis of the coil, in which direction its elastic force is extended. The company claim for this method quickness and ease of action, while the combination of spring and shape of frame permits the shear to open sufficiently wide to take in a large stick without cramping or tight action when the blades are closed. It is especially adapted to grape culture and florists' uses. This shear is made in one size, 9 inches long, and will be known as Buckeye No. 99. They still make as heretofore the three sizes of the French pattern with coil springs.

ROOFING AND CORNICE.

Elaborate Sheet Copper Work.

The illustrations shown herewith represent, Fig. 1 front elevation, Fig. 2 side elevation and Fig. 3 plan view of a dormer in the shop, corresponding to the bevel of the mansard roof. The cheeks or sides of the dormer are of copper, and were riveted to the dormer at the building after the dormer was set and the roof slated. The roof of the dormer dered on the outside was first wiped clean with a damp rag to remove the acid, then dried. When dry the entire dormer was coated with linseed oil by means of a woolen rag soaked with oil. After this was dry the outside soldered

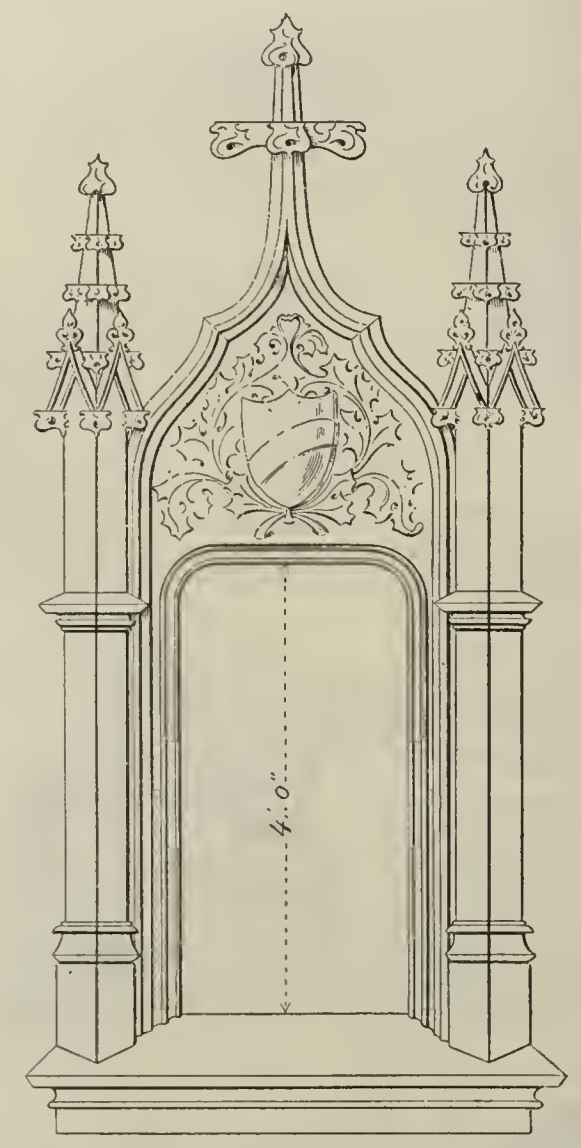


Fig. 1.—Front Elevation of Dormer Window

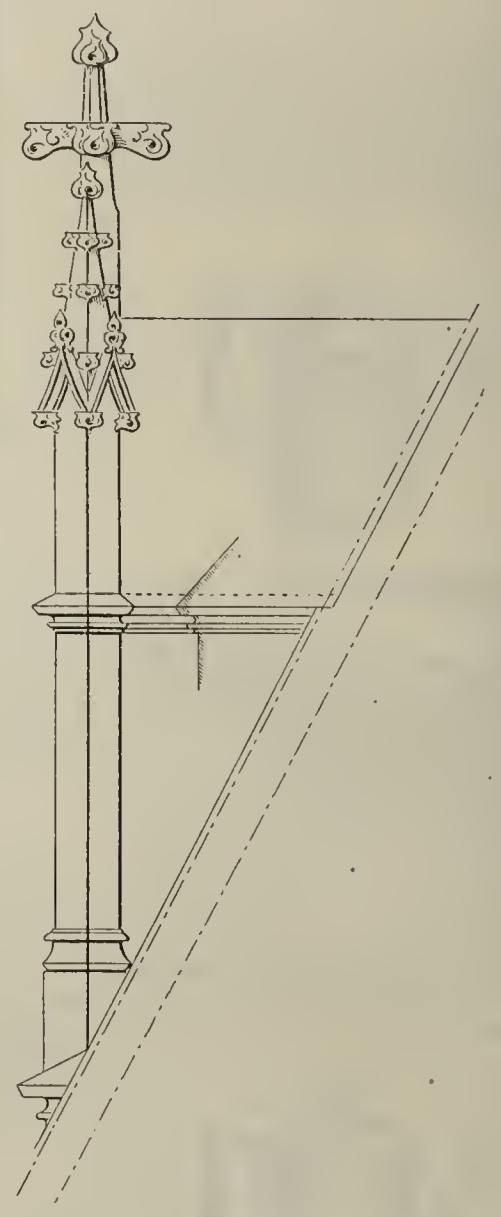


Fig. 2.—Side Elevation.

dormer window made of 20-ounce cold rolled copper. The round corners shown at the upper part of the window openings, likewise the moldings at the top of the dormer, were entirely hammered by hand, raising or stretching the blanks as was required. The center ornament was stamped with background complete and riveted to the flange made on the curved moldings for that purpose and soldered on the inside. The center finial was stamped in parts, soldered together and attached to the hammered work below the crockets. The side pilasters were formed in separate parts, riveted to the copper work, as shown in front elevation, after which the pinnacles were placed in position. In constructing the pinnacles the square pyramids shown on each side in front elevation were first formed and then attached to the square shafts below, after which the small crockets and gables were soldered in their proper positions. The return molding, shown in the side elevation, Fig. 2, was soldered to the

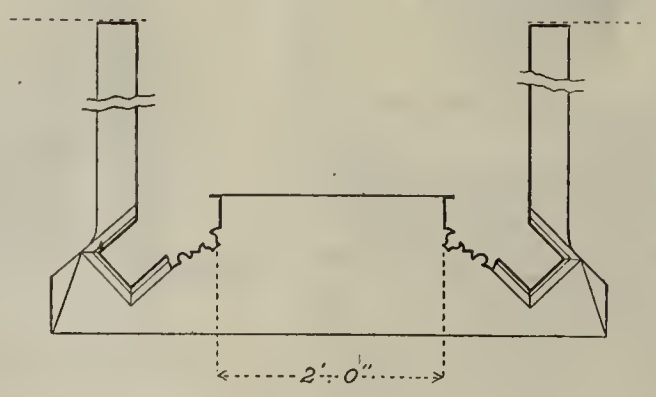


Fig. 3.—Plan.

ELABORATE SHEET COPPER WORK.

is covered with slate. All the joints and seams, where possible, were soldered on the inside, so as to show a clean surface. All other work which had to be sol- parts were bronzed with copper bronze of the same shade as the sheet copper, which gives a clean finish. The hight of the finished dormer measures 10 feet

9 inches from bottom of sill to top of finial. This copper work was made in the shop of J. Foerster & Son, 806 Fifth street, New York.

A Chat on Copper Roofing.

In a conversation with J. Flanagen, 396 Fourth avenue, New York, he made the following observations on copper roofing:

The roofing and, in fact, all of the sheet iron and copper work of the new Criminal Court Building, New York, was put on by my men. The steep part of the roof was covered with copper Spanish tile, and the flat portion with 18-ounce sheet copper, put on in the ordinary manner, one sheet at a time, like tin roofing. The sheathing on which it was laid was well seasoned, dry 1½ inch planking supported by rafters that were sufficiently close together to make the roof firm, so that when the seams were beaten down with a mallet the whole building did not shake. The sheets were 14 x 20 in size, notched and edged in a regular roofing brake.

They were laid with cleats, the nails used being of the drive screw character, tinned. In soldering about 8 pounds of solder were used to the square. Such a roof is worth about 25 cents a square foot, and when put on in this way it is not only calculated to last an indefinite time, but in case it should be taken off for any reason the old roof will bring enough money when sold to a junk dealer to pay for a new tin roof. Another advantage is that it never needs painting. The roof has now been on the building for over a year, and no difficulty has been experienced from expansion and contraction. The roof of the City Hall was put on about 50 years ago, and was put on in the standing seam style, and shows to-day in perfectly good condition, and has never had a coat of paint. If the people knew the advantages that follow the use of copper for roofing, it is probable that more would be used. Its use for covering public buildings is growing, and as architects and builders become more experienced with it, those who can afford to pay the price will specify it to be used on buildings in which they invest their money.

FLASHINGS.

J. Flanagen, 396 Fourth avenue, New York, is furnishing the galvanized iron work and copper front for the annex to Grammar School No. 25, at 104th street and Amsterdam avenue. The gothic windows at the top of the building will be covered with slate, while the roof will be of Meurer triple coated IX tin.

Schwing & Co., 190 Ferry street, Newark, N. J., make a specialty of architectural sheet iron work. They are making 24 large skylights for the Celluloid Company of Newark and furnishing skylights, sheet metal front and cornices for the new opera house at Elizabeth, N. J. They are making a new cornice for the store of A. F. Leicht, at Jersey City, N. J., and cornices and skylights for a school at Franklin, N. J.

"Total Eclipse" is the curious title of a little pamphlet of which we have recently received a copy. Further inspection shows that it relates to the Eclipse gutter beading and forming machine made by the Eclipse Machine Company of Troy, N. Y. Illustrations are given of the machine and testimonial letters are presented.

The Phœnix Plumbing Company, Phœnix, Ariz., have completed a large sheet iron front for the new business block being erected by Dr. Mahoney, adjoining the post office.

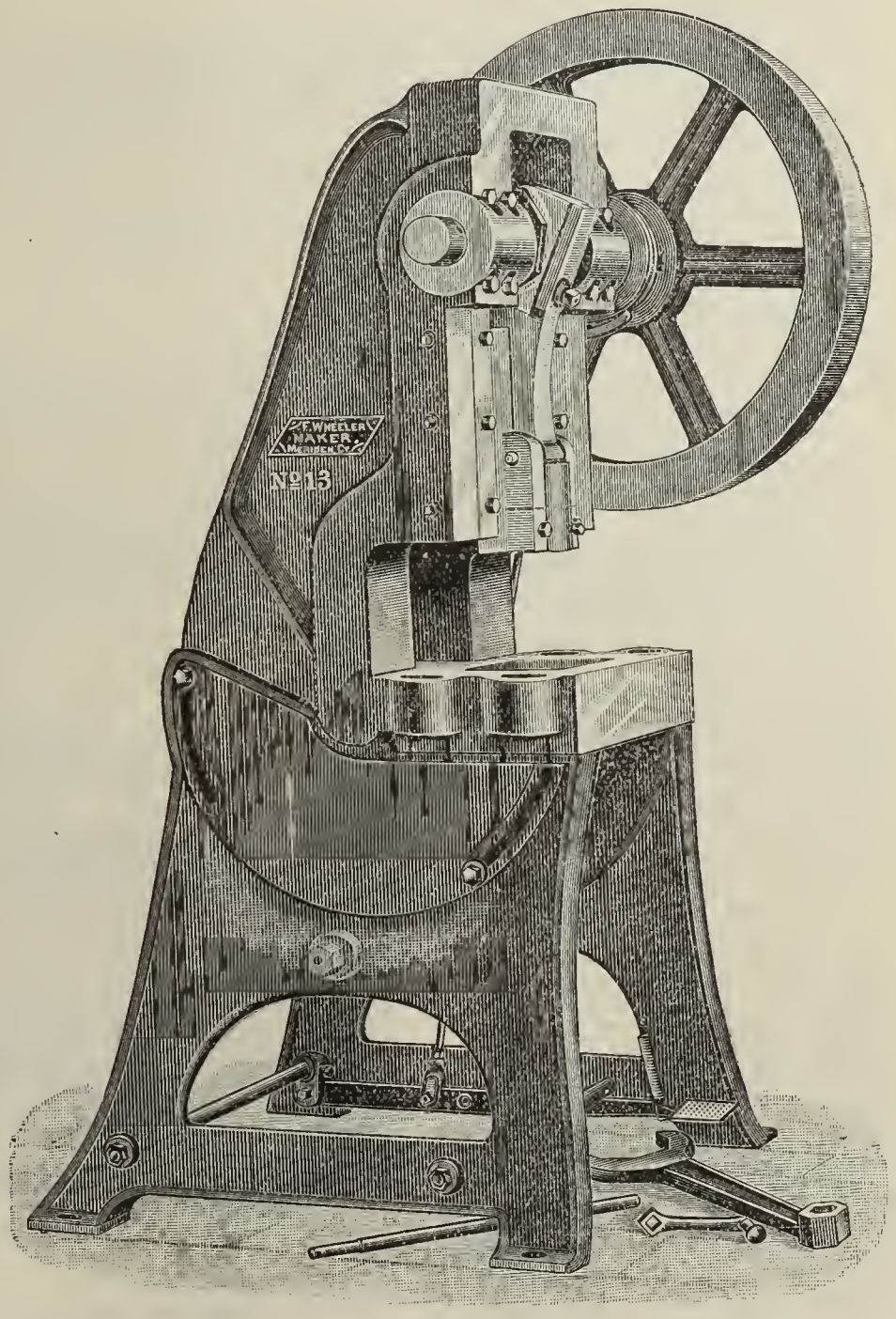
J. C. McFarland, 2511 to 2519 State street, Chicago, is to furnish the copper cornice, gutters, flashings, terra cotta cresting and 110 squares of Spanish tile roof for the residence of Philip Armour, Jr., Michigan avenue and Forty-seventh street.

The Wheeler Press.

This press, built by Frank Wheeler of Meriden, Conn., is provided with an incline adjustment, consisting of a sliding box placed on top of the pitman. The solid pitman is so arranged that all the strain and pressure come upon solid metal, the lower end of the pitman being seated in the solid metal of the slide or gate, and not resting upon a screw or pin. For adjusting the punch to the die it is simply necessary to turn a screw after loosening the clamping nut, when the box can be moved up or down the incline to the desired position.

The pressure at the time when the press is doing its heaviest work is brought squarely upon the end of the pitman, thereby relieving the adjusting screw and clamping nut from all strain and obviating the tendency to slip or strip the thread of the screw.

The machine is provided with a double clutch, which makes two points of contact simultaneously on opposite sides of and in and near the center of the press shaft. This does away with the cramping and twisting tendencies usual in clutches where the contact is made at only one point. By means of an automatic brake the press is stopped gradually and easily, there being no jolt or jar. The grate is so constructed as to take up all wear automatically and is provided with a self oiling device. The machine has a positive "stop up," which is simple in construction and automatic in operation.



The Wheeler Press.

Canadian trade returns for the nine months ended March 31 show a slight decrease in both exports and imports. Exports were $89,506,306, or $41,000 less than in the corresponding period of last year, while the imports were $86,197,918, or $825,022 less. The duty collected for the period exhibits a falling off of $500,000.

PLUMBING and GAS FITTING.

The Chicago Plumbers' Settlement.

The new agreement made by the Chicago master plumbers and the journeymen on the 25th ult. is practically the same as that which was in force for the previous two years. The rate of wages is to remain at $3 75 a day of eight hours. From June 15 to September 15 the hours of work Saturday will be from 8 a.m. to 12 m., for which the journeymen are to receive $2.25. Overtime is to be computed at one and one-half times the rate for regular time, except Sundays, national holidays and time after midnight, which is to be counted at twice regular time. Journeymen working outside the city will have their board and railroad tickets furnished, and when traveling at night will have a sleeper furnished when the distance is more than 100 miles. Time when traveling is to be computed as if the men were at work, except that single time will be allowed for Sunday and no charge made for traveling at night. The journeymen's association agrees to use all honorable means to make good any careless or incompetent work of any of its members.

All differences arising between employers and employees are to be settled by a committee of arbitration selected from the members of the association. No strike can be declared without first submitting the grievance to arbitration. Rules governing apprentices will be adopted by a joint committee selected from the two associations, which shall make its report before September 15, 1895. The new agreement is to remain in force until March 1, 1896.

Venetian Bath with Patent Folding Needle Bath.

The L. Wolff Mfg. Company, 93 West Lake street, Chicago, have brought out a new and decidedly original arrangement for the bathroom, which is illustrated in the accompanying cut. The tub is highly ornate, being a white enameled iron Venetian bath, finished in zinc, white outside with two gold bands, all polished and nickel plated, Fuller double faucet with connection for bottom supply, supply pipes to floor, all polished and nickel plated Ideal waste, a 3 x 2-inch cherry roll rim rabbeted to fit the flange of the tub, legs of ornamental design, 19 inches inside depth, 26 inches inside width and in two lengths, 5 feet 5 inches and 5 feet 11 inches outside measurement. The tub is fitted with a needle and shower bath, so constructed that it can be folded together when not in use, and is adapted equally well for Turkish baths, athletic clubs, &c., or the private bathroom. When folded it requires but 9 inches of space, this being the projection from the wall, and therefore it can be used in the smallest bathroom.

When placed over a bathtub and folded it leaves the tub entirely free for the bather's use. This needle bath is strongly made and carefully put together and is of handsome design. The shower and needle bath or the bathtub fixtures can be operated separately or together as desired, each being governed by its own valves.

The Smoke Test.

The following is an account of a smoke test made by Boyd & Schnaier, 347 Columbus avenue, New York, in the residence of R. A. Myres, 59 East Ninety-second street, and which, in view of the attention now being attracted by this kind of test, will be read with interest. The building in which the test was made was a dwelling of four stories and a basement in which the plumbing system has been in use for seven or eight years. There were three soil pipes coming through the roof, and the back air pipes from the fixtures were connected with these pipes above the highest fixtures and below the roof. One was at the back of the house and the other two at the sides of the house, nearly opposite, near the center.

The test was made from the roof, as the fresh air inlet at the street was inaccessible. A hose led from the machine used for the test to the soil pipe, where it came through the roof and entered the open end, and the space around the hose was closed by packing with waste or oakum. The smoke chamber of the machine was charged with tarred paper, such as is used often in roofing, and in order to make a dense and penetrating smoke some waste that had been saturated with turpentine and also some sulphur was put in. The charge was lighted at the bottom, the chamber covered and the machine operated, which pumped in a continual current of air at the base of the charge which generated the smoke and forced it out through the hose into the plumbing system. As the smoke was driven down through this line of pipe it finally reached the horizontal pipe in the cellar and from the branches into it finally made its appearance through each of the other two openings on the roof. The other openings were then closed with a wad of oakum and the machine operated gently while a search was made through the house for leaks.

The first discovered was in an old fashioned bell trap placed in the cellar floor to carry off the water that might be used when the cellar was washed. The cloud of smoke which came from this opening showed that the seal of this trap was broken, and on lifting off the cover and stopping the opening with a wad of paper, the trap was



Venetian Bath with Patent Folding Needle Bath.

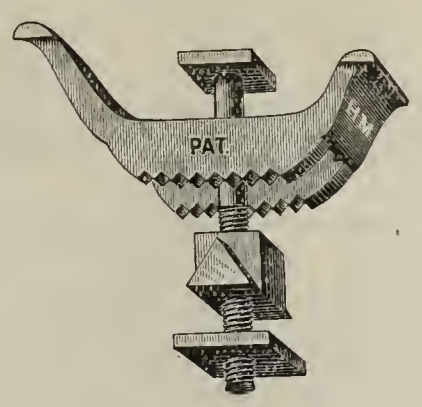
found to be perfectly dry and filled with dust, clearly showing that for over a year this trap has been ineffective and that sewer gases could freely enter the house. The next leak found was on the kitchen floor, in the back air pipe from the trap under the sink where it passed through the wainscoting. A nail had been driven in it and made a hole ⅛ inch in diameter through which gas could escape.

On the floor above, the back air pipe from the lavatory trap in one of the chambers was connected with a vertical branch joint, and in wiping this joint the plumber had not been careful to see that the under side was tinned. In consequence a tight joint had not been made, and had it been used for water the leak would have been readily seen. In appearance this joint was as good as any on the job, but the smell of smoke that filled the chamber and the smoke that puffed from the leak showed clearly where it was located and every movement of the machine on the roof was shown by a little puff of smoke through the opening in the joint. Another leak was found in the water closet on the third floor. This evidently was caused by the soil pipe settling. The leak, instead of being the usual vertical split in the pipe, caused by careless calking, was due to a break extending around it, just where the pipe proper connects with the hub. Though a candle was used to examine the crack, it was so fine that it was difficult to see it, yet the smoke puffed from it promptly with every stroke of the machine on the roof. The cause of some of the leaks in this section of the city in old houses may be due to the fact that rock underlies the ground, and in digging the cellars for new buildings the rock is blasted out, jarring the whole nighborhood. While this test was being made a severe shock was felt in the building as the result of a blast going off about half a block away.

THE STAR COUPLER COMPANY, St. Louis, Mo., report a heavy demand for their Star water back and boiler couplers. They are at present running night and day in their efforts to keep abreast of their orders. They recently received an interesting letter from Geo. M. Clark & Co., Chicago, Ill., who subjected the coupler to 250 pounds test and found it worked perfectly, and as the result of this test they are duplicating their orders. The Star Coupler Company received the contract for the new Planters' House, St. Louis. The couplers were specified and will be used for connecting 250 gas grates and logs. The Dawson Bros. grates of Chicago, Ill., will be used.

The Mueller Basin Clamp.

The H. Mueller Mfg. Company of Decatur, Ill., are manufacturing a basin clamp of newly patented design, which is herewith illustrated. This clamp is adjustable, so that it will fit any thickness of flange on the bowl. The main body of the clamp has a long slot in the center through which the bolt passes, thereby allowing the longest possible range of adjustment lengthwise. For this reason it is not necessary that the bolt be placed at any certain distance from the flange of the bowl. The washer, being wedge shaped, will always adjust itself to form a square bearing for the nut. That part of the clamp which comes in contact with the washer is notched, so that the washer holds it firmly in place, thereby preventing it from slipping. All the goods manufactured by this company are branded "H. M.," and they will warrant anything they make.

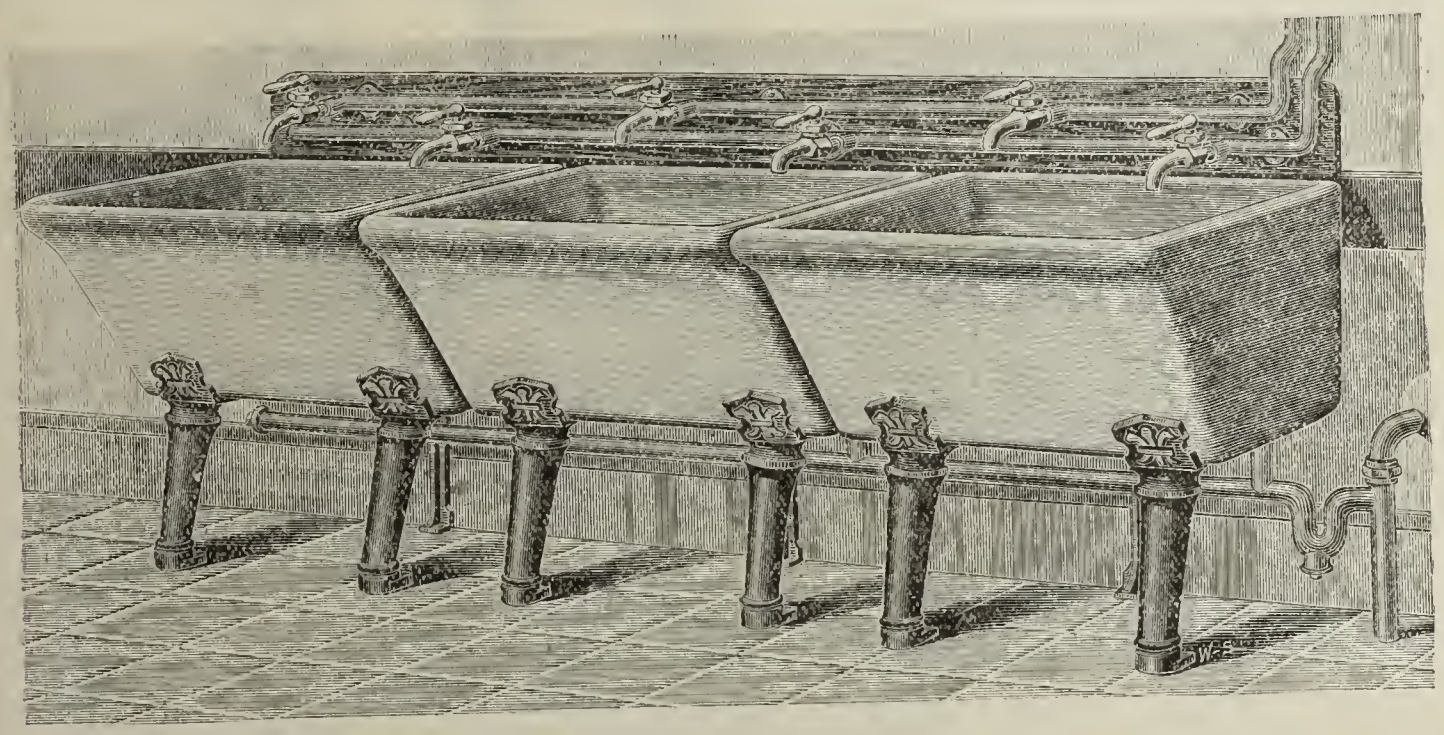


The Mueller Basin Clamp.

ROURKE & MCDONOUGH have retired from the plumbing business, at Knoxville, Tenn., and Kirk & Stout, two of their former employees, will succeed them. The firm of Rourke & McDonough, so long known in the plumbing business, will henceforth give their whole attention to the heating of buildings and to handling plumbing supplies.

Yorkshire Brown Glazed Laundry Tubs.

We show in the accompanying illustration the Yorkshire Brown Glazed Laundry Tubs, manufactured by Evens & Howard, St. Louis, Mo. A special feature of these tubs is that each one is made of a single piece of earthenware, hardened at a very high heat, and covered in and outside with a strong glaze of a rich dark brown color, which is said to be absolutely impervious to water, grease or acids. The corners are rounded, thus giving every facility for cleaning. They are finished with roll rims and supported by cast iron standards, as shown. The length, outside dimensions, of standard size, is 27½ inches; width, 22 inches; hight, 16 inches, and thickness, 1½ inches.



Yorkshire Brown Glazed Laundry Tubs.

TRAPS AND VENTS.

THE SHOW WINDOW of O'Brien & Lavelle, 162 East Twenty eighth street, New York, is arranged to attract the attention of all who pass. It shows on one side a lavatory fitted up with nickel pipes and trap, having a yellow sienna marble slab and a bowl decorated with flowers and gilt. On the other side they show a gilt decorated square top syphon jet water closet, connected with flush tank. In the center space is a porcelain lined cast iron bath, which is also decorated in gilt, resting on a Persian rug. The bottom of the window is covered with tile and a good idea is given of a model bathroom.

GEORGE M. FOSTER & Co. are a new house at 345 East Fifty-ninth street, New York, who make a specialty of plumbers' marble work, both for fixtures and wainscoting and flooring bathrooms or apartments.

THE L. WOLFF MFG. COMPANY, 93 West Lake street, Chicago, have just brought out their Supplement No. 1 to advance Catalogue B, in which they illustrate and describe Wolff's enameled iron baths. This is a 40-page cata-

logue, large quarto, filled with very choice engravings and exquisitely printed. A very great variety of enameled iron baths is shown, from rigidly plain ones to others of the most artistic finish in shape and decorations. Illustrations in colors are given in the catalogue of hand painted borders, which are used in decorating the more expensive bathtubs. The company are now producing an enamel which has proved very satisfactory. It makes a beautiful finish and is of a rich pure color. They enamel all their own goods. In addition to baths, the catalogue contains illustrations of Wolff's patent folding needle and shower baths; also bathroom fittings, such as nickel plated and brass towel racks, soap cup, tumbler holders, sponge holders, &c. Samples of the company's enameled goods and other plumbing specialties are on exhibition at their showrooms at 91 Dearborn street, Chicago; 1533 Blake street, Denver, and 11 North Washington avenue, Minneapolis. The last named branch has but recently been established, and is in charge of F. J. McArdle.

N. MEREDITH, Johnstown, N. Y., will move his plumbing shop from Church street to the store on South Perry street.

S. & A. CLARK, plumbers, are now in their new place of business at the corner of North Fourth and Prospect avenues, Mt. Vernon, N. Y.

CHAS. F. GEISSELE, 224 Ferry street, Newark, N. J., is one of the busy plumbers of that city.

AT A MEETING of the Master Plumbers' Association of Pittsburgh, held in the Builders' Exchange in that city on Tuesday, May 1, the following delegates were selected to attend the National Convention of the Master Plumbers' Association of the United States, to be held in Detroit, Mich., in June: R. J. Bradshaw, J. O. McGinniss, F. J. Gray, Joseph Rice, Frank McKnight, A. R. Tate, J. J. Cowling; alternates, William Collins, Samuel Harr, John Madde, Leo McShane.

DEMOCK, FINK & Co. are fitting up their showroom at 80 John street, New York, in a similar style to their showroom at 214 and 216 East 125th street. A row of water closets are set on Italian marble slabs against a wainscoting of Italian marble, with their flush tanks and nickel plated flush pipes connected with them all ready for use. The Primrose syphon jet has the place of honor, and is a handsomely decorated closet. The Orient and Melrose are front and back washout closets, representing the best productions in their line. These are followed by other closets of less pretensions in decoration. They also show a fine line of lavatories, the slabs being of Numidian, Verona, Italian and Knoxville marble and one handsome onyx. They are fitted with different styles of nickel plated fixtures and bowls in different styles of ornamentation. A handsome porcelain enameled bath is placed in the center of the floor, and white porcelain and brown Yorkshire laundry tubs are also conspicuously displayed.

THE INSTANTANEOUS WATER HEATING COMPANY, Chicago, have established an Eastern branch at 838 Broadway, New York, where they will carry a full line of Douglas and Acme heaters for heating water for domestic purposes. S. Bernstein, manager of the company in Chicago, has been in New York for the past month arranging for the Eastern branch. With him is E. Brownhill, who has been with the company in Chicago and who will be the Eastern manager.

G. M. SINCLAIR, plumbing inspector, Hoboken, N. J., reports a general improvement in the quality of plumbing work as conducted under the regulations of the sanitary code. He feels certain when the craft becomes thoroughly acquainted with the new condition of things and the rules more strictly adhered to, great good will result.

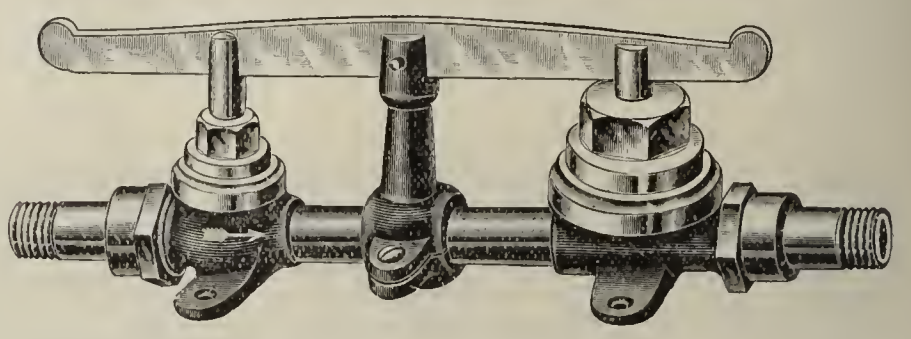
JOHN C. C. BOHLMAN & Co. have fitted up a building in the rear of the former's residence and fronting on Tyler street, Pittsfield, Mass., for their plumbing establishment, and are now ready for business.

ALCOCK PLUMBING COMPANY have been incorporated at Chicago, with a capital stock of $12.000. The incorporators are Joseph R. Alcock, Charles Alcock and W. J. Alcock.

SOME DISCUSSION is going on in the local papers of Hoboken, N. J., in reference to a new sanitary code that is being enforced. With the plumbers generally it is popular, as it is of the progressive character and modeled after the plumbing laws of New York City. On the other hand, as it makes some radical changes in the plumbing practice and requires a more expensive system than formerly, it is being sharply criticised.

Bennett's Water Pressure Regulator.

We show in the accompanying illustrations a general and a sectional view of Bennett's water pressure regulator, put on the market by the Bailey-Farrell Mfg. Company, Pittsburgh, Pa. Fig. 1 is a general view of the device, while Fig. 2 is a sectional view, showing its internal construction and its method of operation. The purpose of this device is to deliver water automatically from the street mains into the service pipes at any desired pressure, irrespective of the variations of the water pressure in the street mains. The regulator, it is said, responds quickly to the slightest fluctuation of initial pressure and maintains a constant, uniform pressure on the house service. It is placed on any convenient point on the water pipe supplying the house with the inlet end D, Fig. 2, at the street main. The water supply enters through D, K and E and exercises its pressure on the enlarged diaphragm J, communicating the water pressure from the house service pipe I through the scale beam A to shut off the pressure at the diaphragm K. The amount of pressure to be carried in the house service pipe at I can be adjusted by moving the fulcrum F to the right or left as desired. The device is spoken of as a simple, sensitive automatic regulator, having no wearing out parts except the rubber diaphragms J and K,



Bennett's Water Pressure Regulator.—Fig. 1.—General View of the Regulator.

which can be replaced as easily as an ordinary compression bibb can be repaired.

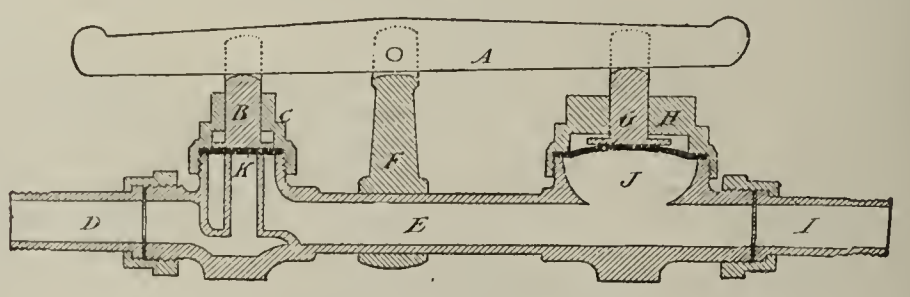


Fig. 2.—Sectional View.

The British Government allotment for reserve merchant cruisers, to be held at the government's disposal in case of war, is announced to be $162,500 for the present fiscal year. The companies subsidized are the Cunard for the "Campania" and "Etruria," the P. & O. for four large vessels of between 6000 and 7000 tons, the White Star for the "Teutonic" and "Majestic," and the Canadian Pacific for their three 6000-ton steamers, the "Empress of Japan," "Empress of China," and "Empress of India." In addition, the Cunard Company hold in readiness three vessels, the "Umbria," "Aurania," and "Servia," the White Star, the "Germanic," "Britannic" and "Adriatic" and the P. & O., 10 vessels of about 5000 tons each. Thus the Government pays for 12 steamers and gets 16 free.

The London *Economist* finds that a decided revival of business has begun in England. Although prices have declined 5 per cent., the values of exports are about on a par with those of last year, which they exceed in amount. Labor is more fully employed than at this season a year ago, the number of manufacturing establishments in operation is increasing, and reports from the chief industrial centers indicate a more hopeful feeling. Railway receipts, too, for the first quarter of 1894 were over 3 per cent. larger than those of the March quarter in 1893.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE J. F. PEASE FURNACE COMPANY, Syracuse, N. Y., have been awarded the contract for the heating plant and the water closets and urinals for the Franklin School Building, at Bethlehem. The Demorest system of water closets, manufactured by the J. L. Mott Iron Works of New York, will be used.

JOHN A. SCOLLAY, 74 and 76 Myrtle avenue, Brooklyn, N. Y., has been awarded the contract for installing a hot water heating plant in the residence of J. H. O'Neil, Surrogate of Hudson County, at Jersey City, N. J.

THE A. HARVEY'S SONS MFG. COMPANY, Detroit, Mich., have been awarded a contract amounting to about $150,000 by the Economy Light, Heat & Power Company of Scranton, Pa., for the erection of a central plant and laying mains through that city for furnishing heat and power to customers. It is to be in operation by September 15.

C. H. GREEN, plumber, on Wyandotte street, South Bethlehem, Pa., has received the contract for doing all the sanitary and plumbing work at the new residence of Instructor Biggin of Lehigh University, on Broad street, West Bethlehem.

MRS. COLEMAN-STUCKERT is to build a co operative house in Hyde Park, Ill., which will cover an entire block and cost $200,000. It will have electric light, steam heat and a system of plumbing.

MCDONALD & Co., 296 Sixth avenue, New York, are engaged in installing the plumbing system in the new annex to the Buckingham Hotel, Fifth avenue, New York. They are also about finishing the work in the Home Life Insurance Building and the Bowery Savings Bank, New York.

ARCHITECTS BROMPTON & LAWSON, Chicago, have prepared plans for a three-story apartment building, to be erected at 1322 Sheffield avenue for A. Allender. Galvanized iron work front; heating not decided.

ARCHITECT W. J. VAN KUREN, Chicago, has designed for J. E. Decker a three-story apartment house, to be erected on Park avenue, near Grove street, in Austin, Ill. Steam heat is to be used.

ARCHITECTS KIRKPATRICK & COLLINS, Chicago, have planned for George Blume, at Lawnsdale avenue, near Eighteenth street, a two-story flat building, to be heated by steam; for Mrs. H. F. Wallace, at 1181 Wilcox avenue, a two-story residence, to be heated with a furnace; for J. D. Rowe, at Wilcox avenue and Forty-fourth street, two cottages, to be heated by furnaces.

ARCHITECT F. NEWELL, Chicago, has prepared plans for the People's Institute, to be built on West Van Buren and Leavitt streets, with pressed brick and terra cotta front, tile and copper roof, cement and metal work, &c.

ARCHITECT L. G. HALLBERG, Chicago, has designed for George A. Stevens ten two-story houses, to be built at Clifton and Greenwood avenues. Warm air furnaces are to be used for heating.

ARCHITECT JULIUS HUBER, Chicago, has designed for Charles Steinbreecher a five-story apartment house, to be erected at Milwaukee avenue and Union street. It will be heated by steam and will be equipped with all modern improvements.

ARCHITECTS WORTHMAN & NEEBE, Chicago, have drawn plans for a three-story flat building, to be erected at Twelfth street, near Ogden avenue, for Mrs. Catherine Armstrong, to have all modern improvements, including galvanized iron work.

SMITH & WEBSTER, 15 to 21 North Clinton street, Chicago, are to furnish 50 No. 9 S. & W. porcelain baths, lavatories, &c., for the Holmes Hotel, Minneapolis. W. W. Sykes & Co. of the latter city do the plumbing work.

FOSTER & GLIDDEN, agents for the Farquhar Heating Company, 53 Dearborn street, Chicago, have the contract for placing a No. 28 Panama warm air heater in the residence of J. C. Triger, Blue Island, Ill.

THE BAKER & SMITH COMPANY, 193 to 197 Van Buren street, Chicago, are to furnish two tubular boilers and the necessary radiation for steam heating in the Kentucky School of Medicine, Louisville, Ky.

ARCHITECTS STILES & STONE, Chicago, have designed for J. Marshall a double residence, to be built at Fifty-fourth street, between Jefferson and Washington avenues, to be heated by hot water. The same architects have planned for Nicholas Hunt a three-story apartment house to be built on Monroe avenue, between Fifty-seventh and Fifty-eighth streets.

BLAKE & WILLIAMS, 197 Wooster street, New York, are engaged in installing a heating plant in a school at Forty-sixth street and Sixth avenue. The contract amounts to $26,000, and will include a combination of the blower and exhaust systems with both direct and indirect radiation. They are also installing a heating plant in the addition to the New York City Building for the Insane, at Central Islip, L. I. This contract amounts to $36,000, and a feature of this system is that the extreme radiation is placed over half a mile from the boiler. The water is returned from the system to a tank and is pumped into the boiler. They are also engaged in installing a heating plant in the new government building at West Point, N. Y. This contract amounts to $30,000.

F. E. GRIMSHAW, East Hampton, L. I., has the contract for the plumbing in a new residence to be erected on the Dunes near the ocean by H. A. James of New York City. The water is brought across from Georgica Pond more than 1000 feet by an air motor mounted on a steel tower 40 feet high which operates a pump. O. H. Northrop, well known in western Connecticut, has the work in charge.

ALBERT A. CRYER & Co., 85 Centre street, New York, has been awarded the contract by Capt. Thomas McManus for heating an apartment house on Fifth avenue, in which a No. 320 ten-section steam heater will be used, and a No. 55 Victor steam heater will be used in an apartment house he is erecting at the corner of 115th street and Fifth avenue for the same contractor. They will also install a No. 55 Victor steam heater in the apartment house being erected by Rudolph Guggenheimer, at 101st street, New York.

G. M. SINCLAIR, 106 Fourth street, Hoboken, N. J., is doing the plumbing, heating and electric lighting in the new Fire Department headquarters of that town. A conspicuous feature of the plumbing is the nickel plated piping and faucets, making a very attractive appearance. The heating is by hot water, a Perfect boiler, made by the American Boiler Company, being employed for the purpose. The contract amounts to $2700.

DAVIS, WRIGHT & Co. of Keene, N. H., have the contract for placing a No. 55 Victor steam heater in the dwelling owned by George O. Hayward of Keene, N. H. They have also the contract for heating the block remodeled and owned by F. H. Wright & Co., in which they will use a No. 320 seven-section Richmond heater.

E. H. RANDALL & Co., Concord, N. H., have a number of heating contracts on hand, among which is the contract to heat the house owned by L. R. Wood of Bradford, Vt., in which they will place a No. 418 Richmond steam heater.

SANDS & REGAN, 54 Fifth avenue, Chicago, have the contract for plumbing, sewerage and gas fitting in the residence of A. Leonard, 6026 Wharton avenue.

THE S. WILKS MFG. COMPANY, 113 to 123 Clinton street, Chicago, have received orders for four large water heaters for the new officers' quarters at Fort Riley, Kan.; four 16 x 36 inch self feeding water heaters with automatic damper regulators for the Plattsburg Barracks, Plattsburg, N. Y.; one large water heater and tank for the Y. M. C. A., Cumberland, Md., and one water heater for the Y. M. C. A. new building, Memphis, Tenn. Since the settlement of the local strike city orders are coming in freely.

SCRAP.

THE LOCKOUT in a number of Welsh tin plate works against the 36 box rule still continues, without any sign of yielding on the part either of the employers or the employed.

THE STATISTICAL STATEMENT of imports and exports issued by the Treasury Department for the month of March, 1894, illustrates clearly the marked falling off in tin plate receipts during the present fiscal year. Under the head of "Tin plates, terne plates, and tagger's tin," the imports for the month of March are shown to have been 39,968,992 pounds of the value of $1,055,124, against 55,084,059 and $1,525,878 respectively in March of last year. For the nine months ended March 31 in each year the quantities imported were as follows: 1894, 333,643,743 pounds; 1893, 420,279,313 pounds, and the values were for 1894, $8,938,428; for 1893, $11,830,401.

IN A HANDSOME industrial edition, lately issued, the *Keystone Gazette* of Bellefonte, Pa., suggests that the large nail works of that town, which are for sale, would be admirably adapted for a tin plate works.

N. & G. TAYLOR COMPANY, Philadelphia, have just supplied their Old Style brand of extra heavy coated roofing tin for covering the State Library and Executive building at Harrisburg, Pa. The same brand is also used on the House of Representatives. Messrs. Taylor Company report an excellent and steady demand for all their product, and say their works in Philadelphia are fully employed not only on terne plate, but also on bright tin plate of all kinds.

STEAM AND HOT WATER.

Arrangement of Air Ducts.

BY HELIOS.

Fig. 1 shows indirect radiation with tile cold air duct under the cellar floor and with mixing valve and register in side wall. The cold air pipe is made of sewer pipe and is carried under the cellar floor out through the wall and up to grade, same as shown in a previous article. Great care must be taken in laying this pipe to have all the joints cemented perfectly water and air tight. All the cold air pipe above the cellar floor is galvanized iron.

Fig. 2 shows indirect radiation with tile cold air duct under the cellar floor, without mixing valve, with register in the floor.

Fig. 3 shows arrangement of indirect radiation taking the air from the room that the hot air is discharged into. This arrangement is used in basement houses where the room is on the same level with the boiler and the customer does not want to place a coil or radiator on the side wall of the room that is to be warmed.

Fig. 4 shows arrangement of indirect radiation the same as in Fig. 3, with cold air supply taken from outside the building, having the cold air pipe under the basement floor.

Fig. 5 shows side elevation of indirect radiation, with hot and cold air connections, mixing valve and cold air duct and hot air pipes in the wall of the building. This arrangement is used in schools or other large buildings where there are large numbers of indirect radiators supplied from one cold air duct. The cold air duct is built of brick, the wall of the building being used for one side of the duct.

Fig. 6 shows elevation of indirect

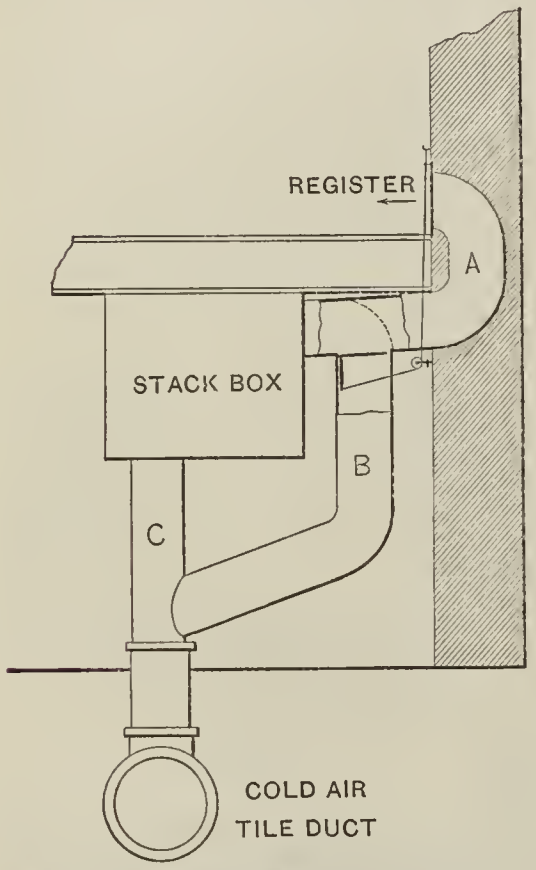


Fig. 1.—Indirect Radiator with Side Wall Register.

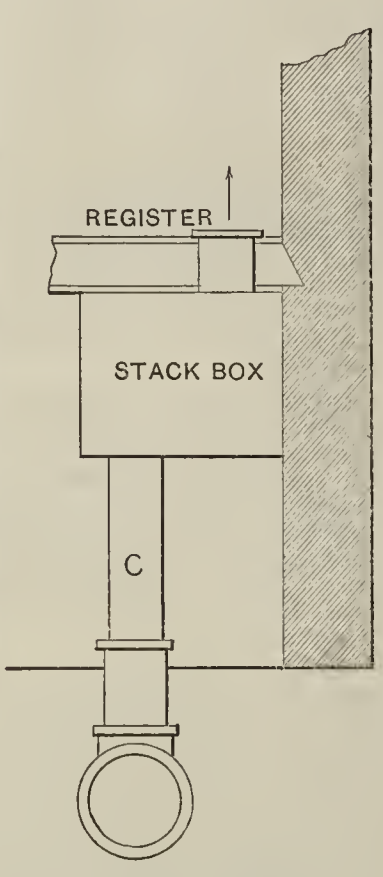


Fig. 2.—Indirect Radiator with Floor Register.

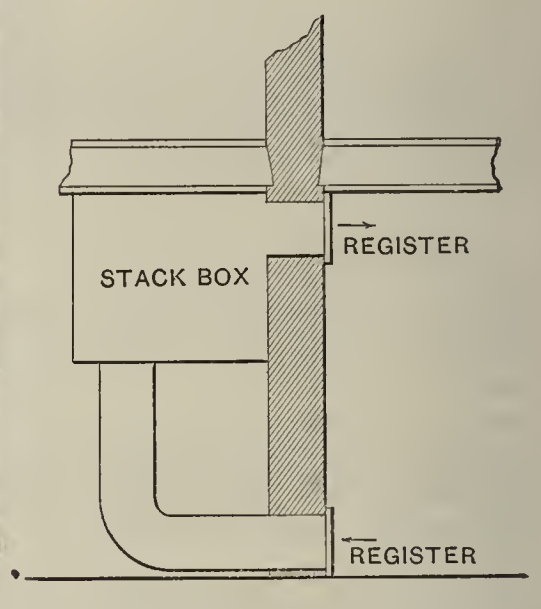


Fig. 3.—Indirect Radiator Circulating Air in Room.

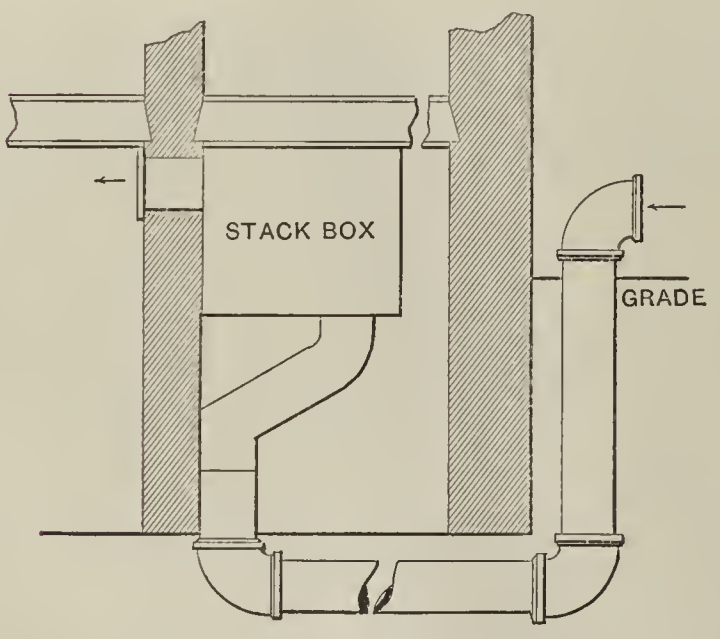


Fig. 4.—Indirect Radiator with Register Near Ceiling.

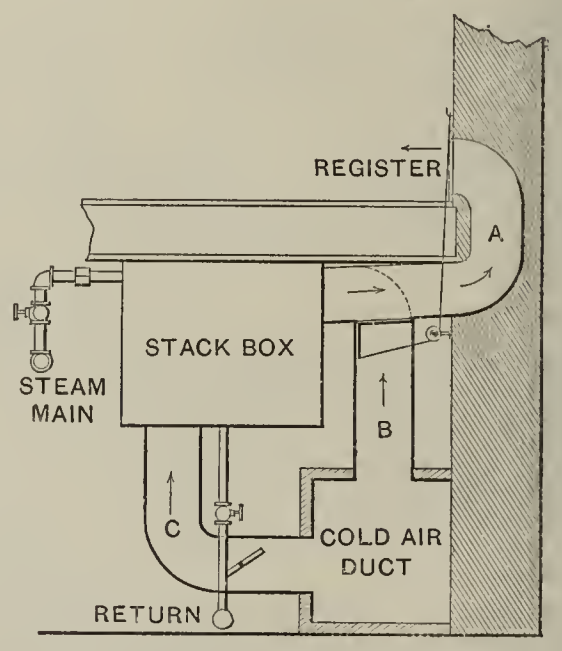


Fig. 5.—Indirect Radiator Used in Large Buildings.

ARRANGEMENT OF AIR DUCTS.

radiation connected to three floors of a building with the hot air pipes placed close together in the wall. The connecting pipes from the radiators to pipe in the wall and discharge of hot air into the rooms to be the same as shown in Fig. 5. C is the cold air pipe to radiators and B is the cold air pipe to mixing valve.

Fig. 7 is a plan of which the elevation is shown in Fig. 6. A, A, A are the hot air pipes in the walls to the first, second and third floors. B, B, B are the cold air pipes from cold air duct to mixing valve. C, C, C show where the cold air pipe is connected to the under side of stack box. The indirect radiators are placed out in the basement about 3 feet from the side wall. This is done to allow for connections to the mixing valves and for hot air pipe connections from the stack boxes. The chains from the mixing valves are run up in the hot air pipe to the room with which the radiation is connected.

Fig. 8 shows an arrangement of indirect radiation where the air is taken from the same room that is warmed. This arrangement is used in stores where there is no room for direct radiation and in halls of churches and schools for foot warmers. It is also very often used in dwellings in place of direct radiators.

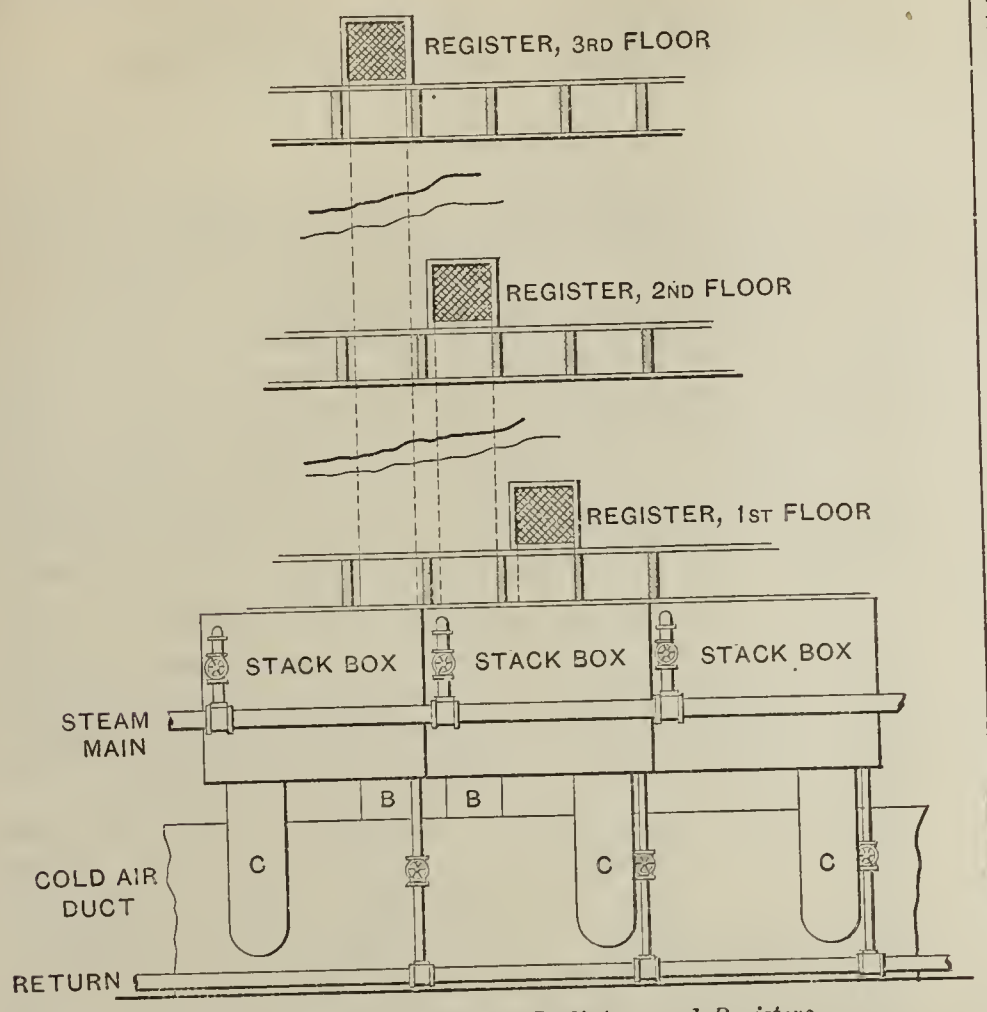


Fig. 6.—Elevation of Indirect Radiators and Registers.

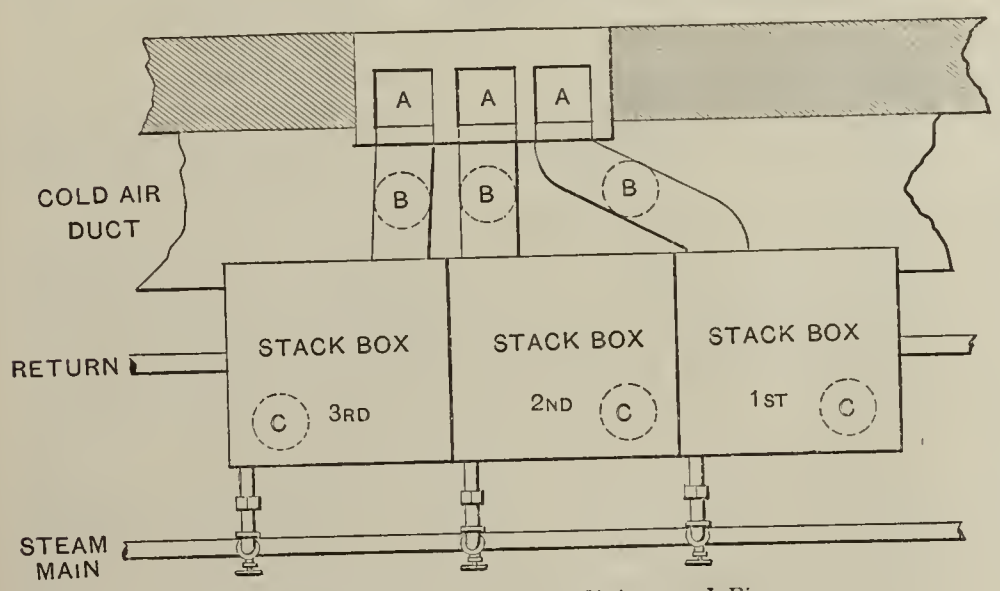


Fig. 7.—Plan of Indirect Radiators and Pipes.

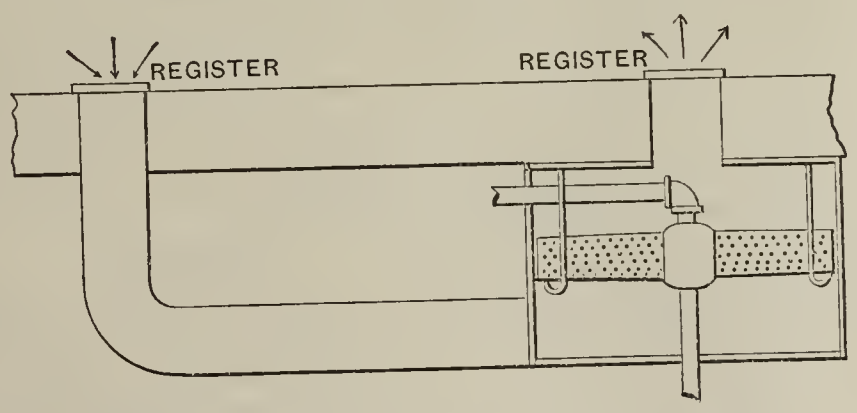


Fig. 8.—Indirect Radiator Drawing Air from Building.

ARRANGEMENT OF AIR DUCTS.

HEATING NOTES.

THE J. L. MOTT IRON WORKS, 84 Beekman street, New York, publish small illustrated circulars particularly devoted to the Sunray heaters. One of the circulars presents a general view of Mott's new Sunray steam heater, together with description and table of sizes and prices. The second circular gives a broken view of Mott's Sunray water heater, and also shows it in connection with a horizontal boiler.

THE A. A. GRIFFING IRON COMPANY, 34 Dearborn street, Chicago, have secured the Western agency of the Gurney hot water heaters, and will carry a full stock of them.

THE ALBANY STEAM TRAP COMPANY, Albany, N. Y., are doing a thriving business, making all kinds of specialties used in connection with steam power. The concern manufacture automatic steam pumps, valves, steam traps, governors, and every device required by users of steam.

HENRY HOUGHTELING, previously with the Gurney Hot Water Heater Company, has accepted the position of traveling salesman for the A. A. Griffing Iron Company, 34 Dearborn street, Chicago.

W. R. HARMOUNT, Detroit, Mich., whose name is familar to the steam and hot water heating trade, has just returned from Europe after a nine months' visit, which was spent in the joint pursuit of business and recreation. Mr. Harmount is much benefited by his outing and is well prepared to again enter into active business.

GEO. E. ADAMS & Co, Glens Falls, N. Y., are well pleased with the hot water heating plant which they placed in the Rockwell House in that city. It has been in every way a success.

W. B. TUFTS, 96 John street, New York, finds an increasing interest in the heating trades for iron pipes and fittings, of which he carries a varied line in addition to other steam and water supplies.

THE MAIN OFFICE of E. F. Keating has been removed to the warehouse and machine shop at 452 Water street, New York. Here he carries a line of everything required by the water or steam fitter, and is prepared to cut pipe to specification. An office is still maintained for the convenience of the trade at 75 John street.

RUBEL & BROTHERS have moved their factory from 209-211 South Clinton street to 114 116 East Lake street, Chicago, Ill.

STOVE TRADE NOTES.

THE TWENTY-THIRD Annual Stove Convention

WEDNESDAY.

The annual convention of the National Association of Stove Manufacturers met in the Banquet Hall of the Auditorium Hotel, Chicago, on Wednesday, the 2d inst.

Members Present.

The following is a list of members present at the meeting:

Barbour, Geo. H., the Michigan Stove Company, Detroit, Mich.
Bell, Joseph, Joseph Bell Stove & Range Company, Muncie, Ind.
Bennett, H. W., Indianapolis Stove Company, Indianapolis, Ind.
Boal, Stanhope, Favorite Stove & Range Company, Piqua, Ohio.
Bowditch, Edward, Rathbone, Sard & Co., Albany, N. Y.
Brasfield, G. M., Wooldridge Stove Company, Memphis, Tenn.
Brisland, James, Home Stove Works, Chicago.
Brooke, J., Floyd, Wells & Co., Royersford, Pa.
Burt, N. H., Great Western Stove Works, Leavenworth, Kan.
Buttorff, H. W., Phillips & Buttorff Mfg. Company, Nashville, Tenn.
Castle, C. H., Comstock Castle Stove Company, Quincy, Ill.
Collins, F. W., the Cortland-Howe Ventilating Stove Company, Cortland, N. Y.
Cribben, Henry, Cribben, Sexton & Co., Chicago, Ill.
Cribben, Wm. H., Cribben, Sexton & Co., Chicago.
Culter, R. A., Culter & Proctor Stove Company, Peoria, Ill.
Dana, Geo. D., Excelsior Mfg. Company, St. Louis, Mo.
DuCharme, C. A., the Michigan Stove Company, Detroit, Mich.
Duffy, Jas., Duffy Trowbridge Stove Company, Hannibal, Mo.
Dugdale, Joseph T., Western Stove Mfg. Company, St. Louis, Mo.
Dwyer, James, Peninsular Stove Company, Detroit, Mich.
Dwyer, Jeremiah, the Michigan Stove Company, Detroit, Mich
Dwyer, John M., Peninsular Stove Company, Detroit, Mich.
Emery, J. W., Channon-Emery Stove Company, Quincy, Ill.
Emery, S. H, Jr., Channon-Emery Stove Company, Quincy, Ill.
Gardner, Fred. W., the Michigan Stove Company, Chicago, Ill.
Goldschmidt, Julius, Brand Stove Company, Milwaukee, Wis.
Graff, H. L., Graff & Co., Pittsburgh, Pa.
Hanrahan, E. C., Peninsular Stove Company, Chicago, Ill.
Hayes, H. E, Bloomington Stove Company, Bloomington, Ill.
Hunter, John E., Culter & Proctor Stove Company, Peoria, Ill.
Kahn, Lazard, F. & L. Kahn & Bros., Hamilton, Ohio.
Kernan, Francis, Syracuse Stove Works, Syracuse, N. Y.
Lee, Fred. E., Beckwith Estate, Dowagiac, Mich.
Leonard, J. J., Toledo Stove Company, Toledo, Ohio.
Lounsbury, James A., Collins & Burgie Company, Chicago, Ill.
Miller, Theo., Art Stove Company, Detroit, Mich.
Moffatt, Albert, Collins & Burgie Company, Chicago, Ill.
Montgomery, J. F., Taunton Iron Works, Taunton, Mass.
Moore, Lewis, Joliet Stove Works, Joliet, Ill.
Moore, W. N., Joliet Stove Works, Joliet, Ill.
Mott, A. C., Abram Cox Stove Company, Philadelphia, Pa.
Mott, Ed. P., Abram Cox Stove Company, Chicago, Ill.
Orr, J. Allison, Mt. Penn Stove Works, Reading, Pa.
Patton, A. G., Patton Mfg. Company, Columbus, Ohio, and Jeffersonville, Ind.
Patton, W. D., Patton Mfg. Company, Jeffersonville, Ind.
Peck, E. W., Co-operative Foundry, Rochester, N. Y.
Perry, Nathan B., Perry Stove Company, Albany, N. Y.
Prizer, Chas. S., Orr, Painter & Co., Reading, Pa.
Pruden, A. K., St. Paul Stove Works, St. Paul, Minn.
Richardson, A. P., Richardson & Boynton Company, New York and Chicago.
Rogers, John, Home Stove Works, Chicago, Ill.
Ruso, James M., official stenographer, Albany, N. Y.
Ryley, A. G., H. Wetter Mfg. Company, Memphis, Tenn.
Sard, Grange, Rathbone, Sard & Co., Albany, N. Y.
Sard, Wm. H., Rathbone, Sard & Co., Chicago, Ill.
Scott, W. H. Sill Stove Works, Rochester, N. Y.
Scivard, H., Mt. Penn Stove Works, Reading, Pa.
Staufer, W. M., Buckwalter Stove Company, Royersford, Pa.
Stevenson, W. S., Thomas, Roberts, Stevenson Company, Philadelphia, Pa.
Thomas, D. M., secretary N. A. S. M., Chicago, Ill.
Thompson, Geo., Enterprise Stove Company, Vincennes, Ind.
Trowbridge, C. H., Duffy-Trowbridge Stove Company, Hannibal, Mo.
Van Cleave, J. W., Buck's Stove & Range Company, St. Louis, Mo.
Van Evera, De Witt, Brand Stove Company, Milwaukee, Wis.
Van Wormer, J., J. Van Wormer & Co., Albany, N. Y.
Venn, James A., Rathbone, Sard & Co., Aurora, Ill.
Viets, H. A., Fuller-Warren Company, Milwaukee, Wis.
Warren, Walter P., Fuller & Warren Company, Troy, N. Y.
Wells, I. H., Collins & Burgie Company, Chicago, Ill.
Wewers, Wm., Gem City Stove Mfg. Company, Quincy, Ill.
Will, Fred., Sill Stove Works, Rochester, N. Y.
Woodruff, J. M., J. Woodruff & Sons, Salem, Ohio.

The session was opened at 10.30 a.m. by President George D. Dana of St. Louis, who made an address in accordance with the usual custom, outlining the events of the year. Secretary D. M. Thomas also presented his official report of the work of the association, together with recommendations for the action of the convention.

A paper was then presented by the Fuller-Warren Company on "The Interchange of Information and Experience Between Stove Manufacturers," which was discussed at some length.

The afternoon session was opened by the reading of a paper on "Cleaning Castings," by Abram C. Mott. Next followed a paper by Henry Cribben on "The Education and Production of Efficient Workmen." Mr. Cribben's paper was so well received that a sufficient number of copies for every molder and apprentice in the country was ordered to be printed.

The Committee on the Secretary's Report submitted the following preamble and resolution, which were adopted as the sense of the convention:

The large decrease in the demand for stoves during the existing business depression, the decreased output and the maintenance by manufacturers of the same scale of wages heretofore paid have materially increased the cost of production.

The selling prices of stoves already so nearly approach the cost of producing and marketing them that any reduction of prices must result in serious demoralization and disaster.

The best interests of manufacturers, of dealers and of labor obviously require the exercise of a wise and confident conservatism through rigid adherence to existing prices and terms, therefore

Resolved by the National Association of stove manufacturers, that current prices and terms on stoves be firmly maintained during the year 1894.

The convention then adjourned until 10 o'clock on Thursday morning, after a session which was pronounced to be one of the most interesting and instructive ever held in the history of the association.

THURSDAY.

(*By Telegraph.*)

Only one session of the association was held on Thursday, and it was opened by the reading of a paper by J. Leon Gobeille of Cleveland, Ohio, on "A Theory of Ornamental Design as Applied to the Decoration of Stoves." The paper was an explication of the Newtonian theory that sound, color and form are all interconvertible and harmonious. It was illustrated with a large number of diagrams, Mr. Gobeille

presenting in colors the music of a hymn and then, by playing on a piano and violin, showing the principles deduced from the colors. The paper was listened to with deep interest and a vote of thanks was given the author at the close.

Charles S. Prizer of Reading, Pa., next read a paper on "Profit Sharing," which evoked considerable discussion. We shall make further note of the papers read at the convention in a later issue. After the reading of the papers the meeting proceeded to the election of officers for the ensuing year, the result being as follows:

President, George D. Dana, St. Louis.

First vice-president, Lazard Kahn, Hamilton, Ohio.

Second vice-president, Francis Kernan, Utica, N. Y.

Treasurer, W. S. Stevenson, Philadelphia.

Secretary, D. M. Thomas, 80 Broadway, New York.

Board of Management, H. W. Buttorff, Nashville, Tenn.; Henry Cribben, Chicago; C. A. DuCharme. Detroit; Frederick Will, Rochester, N. Y., and W. E. Walker, Taunton, Mass.

An assessment for expenses was then made, the same as last year, and Chicago was selected as the place for the next meeting. A discussion of the "Cost System" was then taken up, after which the convention closed its twenty-third annual session by adjournment.

Eavesdroppings.

— ON TUESDAY EVENING a number of the stove manufacturers accepted an invitation extended through George H. Barbour to visit the residence of James W. Ellsworth, on Michigan avenue. Mr. Ellsworth is one of the great coal operators of the country, but is perhaps better known as an art connoisseur and collector of curios. The gentlemen composing the party, in addition to Mr. Barbour, were Messrs. Nathan B. Perry, W. S. Stevenson, Jeremiah Dwyer, George D Dana, C. A. Du Charme, Grange Sard, Wm. H. Sard, A. C. Mott, C. H. Castle, E. W. Peck, Frederick Will, J. W. Van Cleave, Edward Bowditch, Frederic W. Gardner, Alan W. Wood and a representative of *The Metal Worker*. They were received and warmly welcomed by Mr. Ellsworth, who took great pleasure in escorting his visitors through his spacious mansion and exhibiting the art treasures collected from all parts of the world. He has a superb art gallery, hung with paintings by the great masters, among which is one of Rembrandt's most famous works. Hours were spent most agreeably in the inspection of these as well as rare productions in bronze, old china, and artistic work of every description, including priceless treasures in ancient and modern books.

— AS ONE of the visitors walked over a rug eight centuries old, a wicked associate vows that he remarked, "This rug is no older than I feel."

— SECRETARY THOMAS is a sufferer from muscular rheumatism, which manifested itself particularly in his right hand, rendering it awkward on such an occasion as this, when greeting so many friends. He was the recipient of universal sympathy, and is now probably in possession of more remedies for and preventives of rheumatism than he had dreamed were in existence.

— THE WIDESPREAD PUBLICATION a few days before the meeting of the convention that the smallpox had made its appearance in Chicago created consternation in the ranks of the stove men. Telegrams poured in on the local manufacturers inquiring the extent of the reported epidemic, and they had much trouble in satisfying the inquirers that it would be entirely safe for them to sojourn in the city for two or three days. One report in circulation was that the inspectors of the Board of Health were meeting every train on its entrance into Chicago for the purpose of vaccinating the passengers who could not show evidence of their having recently undergone that operation. The fear of being exposed to contagion in Chicago was at last allayed, but for a few days the chances seemed to be strongly in favor of the postponement of the time of meeting or the designation of some other city. The truth is that while smallpox has broken out in a few sections of the city it is by no means epidemic, and such vigorous efforts are being put forth by the health authorities to confine it to these localities that there seems to be little danger of its affecting the general health of the city.

— THE CONDITION of the stove trade was an unfailing topic of conversation among the manufacturers. Not a few stated that their foundries had closed down or were about to do so, as their stock of stoves seemed more than sufficient to supply whatever demand might be experienced for a considerable time. The maintenance of prices came in for considerable discussion in this connection. The general feeling appeared to be strongly in favor of keeping prices up to the old standard instead of trying to force business by making reductions. The argument was made that no greater number of stoves would be purchased even if consumers were offered inducements in the way of lower prices, while, on the other hand, there was a strong probability that the condition of demoralization that would inevitably ensue would result in an attempt to reduce wages and thus cause much friction and unpleasantness, which should be avoided if possible.

— THE NUMBER of stove supply houses represented at the convention was smaller than in previous years. Some very familiar faces were missing which had beamed on stove conventions from time immemorial. The hard times and the paring of margins through excessive competition have undoubtedly had their effect on the stove supply trade, and this year's appropriations for stove convention expenses were either cut down or cut off.

— THE IRELAND & MATTHEWS MFG. COMPANY of Detroit, Mich., had a representative on hand in the person of the genial C. H. Matthews, who made a fine display of top ornaments in one of the Auditorium parlors. The company manufacture hundreds of designs, but exhibited on this occasion a choice selection of the finest. The ancient statuette has now completely disappeared, and in its stead is a creation of filigree work, scrolls and curved bands, usually surrounding a spherical center. Opportunity is thus given for a great variety of shapes, decorations and finishes. The Ireland & Matthews Company do their own spinning, plating, &c, having a factory completely equipped for the production of the finest work of this character, including chandeliers. A novelty they are introducing this year is a nickel steel edge for ranges to take the place of the old cast edge, which is liable to warp and crack. Their edge is shaped in dies to conform precisely to the range for which it is made. They also showed fine new tile effects, with tiles of convex shape, painted by hand in pleasing tints. In connection with this exhibit were shown new draft slides just brought out by H A. Matthews of Waterbury, Conn. The peculiarity of these slides is the attachment of the knob. Instead of being riveted, the knob is held in place by a strong spring which pulls an inside washer tight against the reverse of the slide so that it cannot become loose. The knob is thus easily put in place, but once in position cannot be removed without pushing the knob in. The Ireland & Matthews Company presented the members of the convention, as a souvenir, a very pretty Waterbury watch, inscribed on the back, "We watch your interests," together with the date and the company's name.

— THE MATTHEWS & WILLARD MFG. COMPANY of Waterbury, Conn., were represented by E. A. Ireland, who made a very handsome exhibit of the company's products, comprising top ornaments, knobs, onyx tables and lamps. The top ornaments presented a fine array of very choice designs. Combinations of ormolu and white nickel were conspicuous in a great variety of detail. Perhaps the richest ornaments shown were wholly of ormolu, enriched with scroll work and open work. The managers of this company take pride in their exclusive designs, and their customers this year have purchased more expensive and artistic ornaments than ever before, to meet the requirements of advancing taste among consumers. The company make onyx tables of exquisite finish, trimmed with brass, and a large line of lamps. Every part of the work is done in their own factory.

— A. D. STONE represented the Worcester Ferrule & Mfg. Company of Worcester, Mass., and displayed a great variety of samples of their stove trimmings, comprising door knobs, hinge pins, damper slide knobs, towel rack knobs, &c. The company have greatly simplified the methods of manufacturing knobs since they first engaged in the business and yet have not impaired the quality of the goods in any respect. These knobs are manufactured of steel, which is drawn in dies to the proper shape, then polished and afterward nickeled. Considering the number of processes through which they pass, they are sold to the trade at marvelously low prices. The company have recently added to their line the manufacture of ball bearing steel cups and joint ferrules for bicycles. The joint ferrules are drawn from one piece of steel and take the place of expensive drop forgings.

— J. E. GAITLEY of the Troy Nickel Works, Troy, N. Y., was in attendance upon the convention, but made no display of the products of the works, probably believing that everybody was sufficiently acquainted with the merits of the world renowned Alaska cold handled goods.

— ANOTHER manufacturer who was on the ground but made no display was W. F. Greene, of Troy, N. Y., maker of the Jewel and Crown stove knobs.

The Defense Association.

The Stove Founders' National Defense Association held their annual meeting on Tuesday afternoon, May 1, in the Auditorium Hotel, Chicago. It was well attended, but the proceedings were of much less importance than last year. Then there were two important subjects up for consideration. One was the threatening attitude of the molders, who were apparently determined to force an advance in wages. A conflict seemed imminent, as the leaders among the workingmen thought that they were entitled to an advance by reason of the prosperity which had existed in the stove trade for the previous two or three years. They could not see anything to interfere with another prosperous season for the stovemen, and considered the times propitious for demanding an advance. A delegation of molders had been appointed to attend the meeting of the Defense Association and to present their case. It was a strong delegation and made an excellent impression on the assembled manufacturers, but the latter were wiser in their forecast of the future, as subsequent events proved, and would not grant the desired advance, although it was urged so forcefully by the representatives of the workingmen. It was an exciting time, and the prospects seemed ripe for a trial at arms between employers and employed, when the request of the latter was turned down by a practically unanimous vote of the members of the association. The other important subject was the election of a

secretary. An attempt had been made to work up a hostile feeling against the re-election of D. M. Thomas, the efficient secretary of the association. It was futile, and Mr. Thomas was retained in his position by a vote which showed that he had a strong hold on the esteem of the members, and the opposition amounted to nothing.

This year there were no questions of this kind coming up for settlement. The molders are not looking for an advance in such times as these. They are satisfied if they can get employment at the old rate of wages, instead of suffering a heavy reduction, such as has afflicted their fellow workmen in other branches. The president of the association, Henry Cribben, had no report of an approaching conflict to give his official address any spice. The proceedings were of a tame character. The old officers were re-elected. The only changes made were the appointment of James Dwyer, Detroit, on the committee for the Third District in place of E. S. Barbour of Detroit, who retired, and Julius Goldschmidt of Milwaukee on committee for the Fourth District to fill the vacancy caused by the death of Frederick G. Brand of Milwaukee.

The Philadelphia Stove Trade.

The outlook for the stove trade in Philadelphia is not a bright one. The actual business done since the first of the year shows a decrease of about one-third in volume as compared with the business for the corresponding period of 1893. Founders all agree that unless there is a change in the general business condition of the country before July the prospect for a good season's trade will be slight. Three days a week is about the average running time of foundries, which means a production of little over half what it should be. The present production, however, with the stock carried over from last season, will afford an ample supply for the near future. Warehouses are already filling up, so it is unlikely that the present rate of production will be increased, unless a change for the better is soon noticeable.

A member of one of the largest firms of manufacturers makes the statement that they could almost close down until July 1, and only find themselves short on a few common goods. It is true that stocks in retailers' hands are light, but hand to mouth buying still continues. They are aware of the fact that the consumer is alive to the practice of economy and is prolonging, as well as he is able, the life of an old stove, and this fact was fully demonstrated by the heavy repair business of last season. Should business revive, however, the trade will be heavy, and it is in this hope that production goes on.

Prices seem to be satisfactory and steady, and the cutting which prevails so largely in other lines is noticed but little in the stove trade. Manufacturers seem content to take business as it comes, orders as a rule being too small to entail much competition. The present low price of iron makes little material change in the cost of a stove, the difference in most cases being met by an increase in the weight of the castings. There will be several new lines of goods placed on the market this season, chiefly in the form of square heaters and sheet iron goods, but very few of the new introductions will be of the high priced variety.

The Philadelphia building trade during the month of April took out permits for the erection of 1133 buildings, only 42 less than the number of permits taken out during the same month last year. Building operations, however, in the main are not as good financially as they have been. Stoves and furnaces are expected to be put into new dwellings and equities taken in payment for them. This plan is very unsatisfactory to the stove trade and is attended with considerable risk, as the equities are mostly in the shape of second mortgages, and in the case of a depreciation in the value of property much loss is likely to result.

Jobbers and retailers have found the business in summer goods on the whole very satisfactory. The business was late in opening, but so far has been large.

Collections show little, if any, improvement. Statements seem to have no effect upon tardy customers, and drafts are returned in some cases without remark. It is many years since a like condition was noticeable. It is probably chiefly owing to the retailers' own difficulties in the way of making collections, but in some cases manufacturers feel that the prevailing dullness is being taken advantage of to force extensions of credit.

A noticeable feature in the trade is the cheerfulness which prevails. Although the present prospect is poor manufacturers are on the lookout for a change, and when it comes they will not be found unprepared to take advantage of it.

The Van Wie Gas Stove Works

of Rockford, Ill., have just issued a 30page catalogue of their productions. They are manufacturers of Eclipse and Gilt Edge gas stoves. The illustrations begin with the Eclipse range No. 105, all cast iron, which has five burners on top and two burners for the baking and roasting ovens below. The No. 106 Eclipse is the same construction, except that it has steel sides and back. Nos. 107 and 108 have a broiler on brackets at the side. Nos. 109 and 110 have a water heater in place of the high broiler. Nos. 111 and 112 have a low water heater, with a warming oven over it, arranged at the side of the stove. Nos. 113 and 114 have a broiler placed over the warming oven and low water heater, thus bringing that part of the stove flush with the top of the main part. The New Eclipse range No. 55 is 32 inches high, has two large ventilated ovens and five burners on top. The Nos. 1 and 2 Eclipse have four burners on top and baking and roasting ovens below. The Nos. 10 and 11 Eclipse have three burners on top. The Gilt Edge ranges are cheaper ranges, but the manufacturers say "cheap only in price." They are shown in three styles. Then follow portable stoves of one, two and three burners each, in a variety of styles; lodge stoves, with very large tops and three and four burners, but in portable style; laundry stoves, with steel frames and two or three burners; water heaters of several kinds, to be used independently or in connection with cooking apparatus; an instantaneous water heater of new design and low in price; griddle cake baker, sad iron heater, gas soldering furnace and a gasoline stringer for use in changing gasoline to gas stoves.

Cupola Management.*—XI.

BY DR. EDWARD KIRK.

Daubing.

After the cupola is chipped out the lining is repaired with a soft plastic adhesive material known as daubing, with which all the holes that have been burned in the lining are filled up and thin places covered, and the lining given the best possible shape for melting and dumping. There are a number of substances used for this purpose, some of which are very refractory, and others possess scarcely any refractory properties whatever and are not at all suitable for the purpose. Molding sand is frequently used for a daubing. It is easily and quickly wet up and mixed, is very plastic and easily put on, but possesses none of the properties whatever requisite to a good daubing. It crumbles and falls off as soon as dry in exposed places, and a lining cannot be shaped with it. Furthermore, when put on in places from which it is not dislodged in throwing in the stock it melts and runs down and retards the melting by making a thick slag that is readily chilled over the tuyeres by the cold blast.

Some of the yellow and blue clays are very adhesive and refractory and make good daubing alone or when mixed with a refractory sand. Ground soapstone and some of the soapstone clays from coal mines make excellent daubing. But probably the best and most extensively used daubing is that composed of fire clay and one of the silica sands known under various names in different sections of the country and which I shall designate sharp sand. Fire clay is very plastic and adhesive when wet, but shrinks and cracks when dried rapidly. Sharp sand alone possesses no plastic or adhesive properties whatever and expands when heated. When these two substances, in exactly the right proportions, are thoroughly mixed, they make a daubing that is very plastic and adhesive, does not crack in drying, neither expands nor shrinks to any extent when heated, and resists the action of heat as well as fire brick in a cupola. When not evenly mixed the fire clay cracks and the sand expands and falls out of the clay when heated, making an uneven and uncertain daubing.

Fire clay absorbs water very slowly and it requires from 12 to 24 hours' soaking before it becomes sufficiently soft to be thoroughly and evenly mixed

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with the sand. A large soaking tub should be provided near the cupola and it should be filled with clay every day after the cupola is made up and the clay covered with water and left to soak until the next heat. The clay and sand cannot be evenly mixed in a round tub with a shovel, so a long box and a good strong hoe should be provided for the purpose. The amount of sand a clay requires to make a good daubing varies from one-fourth to three-fourths, according to the qualities of the clay and sand, but generally one-half of each give good results. The sand is added to the clay dry, or nearly dry, and the daubing is made as thick and stiff as it can be applied to the lining and stick. The more it is worked in mixing the better, and if let lie in the mixing box for a day or two after mixing it makes a better daubing than if applied as soon as prepared.

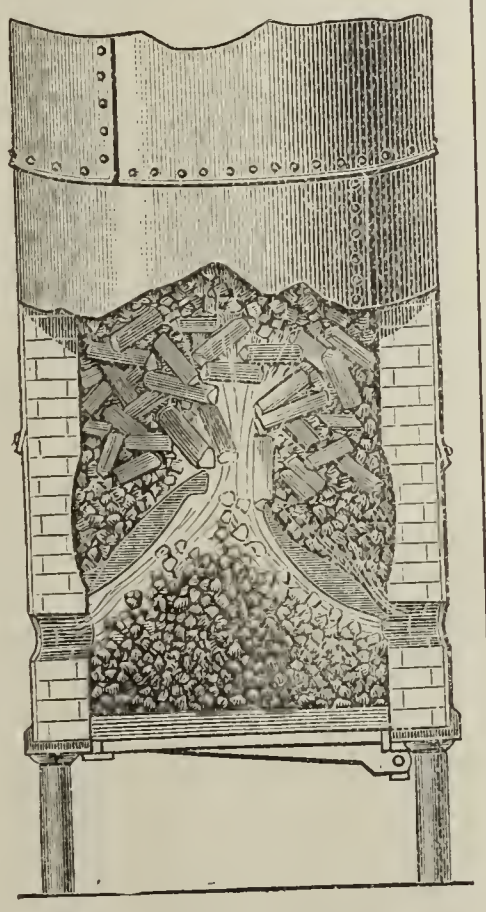
Nothing is gained by using a poor, cheap daubing, for it does not protect the brick lining, but falls off or melts into a thick tough slag which runs down and chills over the tuyeres and retards the melting by bunging up the cupola, and more fuel and time are required to run off the heat. The daubing is taken from the mixing box on a shovel when wanted for daubing and placed on a board under the cupola if the box is near at hand. When it is some distance from the cupola the daubing is placed in buckets or small boxes made for the purpose and conveyed to the cupola. The parts of the lining to be repaired are first brushed over with a wet brush to remove the dust and wet the lining so the daubing will stick better. The daubing is then thrown on to the lining with the hands in small handfuls; it can be made to penetrate the cracks and holes better in this way than in any other and stick better than when plastered on with a trowel. After the required amount has been thrown on in this way it is smoothed over with a trowel or wet brush and made as smooth as it can be made.

Shaping the Lining.

Daubing is applied to a lining for two purposes—viz., to protect the lining and to shape the cupola, and the latter is by far the most important of the two. A great many melters never pay any attention to it, their only aim being to keep up the lining, and they pride themselves on making a lining last for one, two or three years. Nothing is gained by making a lining last for years if the melting is retarded by doing so and enough fuel consumed and time and power wasted every month to pay for a new lining. Besides, a lining will last just as long when kept in a good shape for melting as when kept in a poor one, and the aim of the melter should be to put the lining in the best possible shape for melting and make it last as long as he can.

New linings are made straight from the bottom plate to the charging door when the cupola is not boshed. When it is boshed the cupola is made of a smaller diameter at and below the tuyeres, and the lining is sloped back to a larger diameter from about 6 inches above the tuyeres, with a long slope of 18 or 20 inches. In the straight cupola slag and cinder adhere to the lining just over the tuyeres every heat, and if not chipped off close to the brick after each heat gradually build out and in time a hard ledge forms that is difficult to remove. It furthermore reduces the melting capacity of the cupola by increasing the tendency to bridge. Above this point at the melting zone the lining burns away very rapidly and a hollow or belly is burned in it at this point every heat that requires repairing. Above the melting zone the lining burns away very slowly and evenly and seldom requires any repairing until it becomes so thin that it has to be replaced with a new one.

The cinder and slag that adhere to the lining just over the tuyeres must be chipped off close to the brick every heat and the lining made straight from the bottom plate to 6 inches above the top of the tuyeres. No projection or hump should ever be permitted to form or be made over the tuyeres to prevent iron running into the tuyeres of more than ½ or ¾ inch, and it should be placed right at the edge of the tuyere when it is thought necessary to make it. The upper edge of the tuyere lining should



Section through Bridged Cupola.

be made to project out a little further than the lower edge, and the brick lining should be cut away a little under each tuyere so that molten iron falling from the top of the tuyere will fall clear of the bottom side of the tuyere and not run into it.

It is not necessary or advisable to fill in the lining at the melting zone and make it perfectly straight, as it is when it is new, for a cupola melts better when bellied out at the melting zone. It must, however, be filled in to a sufficient extent for each heat to keep up the lining and prevent it being burned away to the casing. No sudden offsets or projections should be permitted to form or remain at the upper edge of the melting zone, for the stock lodges in settling upon projections and does not expand or spread out to fill a sudden offset, and so the heat passes up between the stock and lining and cuts away the lining very rapidly. No sudden offset or hollow should be permitted to form at the lower edge of the melting zone over the tuyeres, for the stock will lodge on it in settling and cause bridging of the cupola. The lining should be given a long taper from 6 inches above the tuyeres to the middle of the melting zone, and a reverse taper from there to the top of the melting zone. The belly in the lining should be made an oval shape, so the stock will expand and fill it as it settles from the top and not lodge at the bottom as it sinks down in melting. As the lining burns away above the melting zone the straight cupola assumes the shape of the boshed cupola, and only the lower taper is given to the melting zone.

Daubing should never be put on a lining more than 1 inch thick, except to fill up small holes, and even then small pieces of fire brick should be pressed into it to reduce the quantity of daubing and make it firmer. All clays dry slowly and give up their water of combination only when heated to a high temperature. When daubing is put on very thick it is only skin dried by the heat of the bed before the blast goes on. The intense heat created by the blast glazes the outside of the daubing before it is dried through to the lining, and as there is no way for the moisture to escape, it is forced back to the lining, where it is converted into steam and in escaping shatters the daubing or tears it loose from the lining at the top.

In the accompanying illustration is shown a sectional view of a cupola I saw at Richmond, Ind., in 1875. This cupola was a small one, about 35 inches diameter at the tuyeres, and the average heat was about 4 tons. The melter was a hard working German, who knew nothing about melting whatever, and his only aim was to keep up the lining in the cupola. With this object in view he would fill in the hollow formed in the lining every heat at the melting zone with a daubing of common yellow clay and make the lining straight from the tuyeres up. The daubing required to do this was from 2 to 4 inches thick all around the cupola, and was put on very wet. The heat dried and glazed this daubing on the outside before it was dried through. There being no way for the water to escape, it was converted into steam, and in escaping from behind the daubing tore it loose from the lining at the top. The fuel and stock in settling got down behind the daubing and pressed it out into the cupola from the lining until it formed a complete bridge, with only a small opening in the center through which the blast passed up into the stock. Before the heat was half over all the iron melted was running out at the tuyeres, and the bottom had to be dropped. When the cupola had cooled off the daubing and stock were found in the shape shown in the illustration, and when the bridge was broken down it was found to be composed entirely of daubing that had broken loose from the lining in a sheet and doubled over.

This melter always had slow melting and difficulty in dumping. Some nights after dumping he would work at the tuyeres with a bar until eight o'clock before he got a hole through, so the cupola would cool off by morning. The lining was not protected by the thick daubing, but was cut out more by the repeated bridging than if it had been properly coated with a thin daubing. I daubed this cupola properly and ran off two heats in it and melted the iron in less than half the time usually taken, and had no difficulty in dumping clean.

The lining of the boshed cupola does not burn out at the melting zone in the same shape nor to so great an extent as in the straight lined cupola, and in shaping the lining it is made almost straight from the top of the slope to the bosh up to the charging door. The

taper from the bosh to the lining should start at 6 inches above the top of the tuyeres, and should not be less than 18 or 20 inches long, and must be made smooth with a regular taper so the stock will not lodge on it in settling. Should the cupola be a small one with a thick lining and only slightly boshed and burn out at the melting zone similar to the straight cupola, it must be made up in the same way as the straight cupola. The great trouble with boshed cupolas is that the melter does not give a proper slope to the taper from the bosh, but permits a hollow to form in the lining over the tuyeres, in which the stock lodges in settling and causes bridging out over the tuyeres.

These directions for shaping the lining only apply to the common straight and boshed cupolas. Many of the patent and odd shaped cupolas require special directions for shaping and keeping up the lining as it burns out, and every manufacturer of such cupolas should furnish a framed blue print or other drawing, to be hung up near the cupola, showing the shape of the lining when new and the shape it should be put in as it burns away and becomes thin. Full printed directions should be given for chipping out and shaping the lining. All the improvements in cupolas are based on the arrangement of the tuyeres and shape of the lining, and when the lining gets out of shape the working of the tuyeres is disarranged, and the cupola is neither an improved one nor an old style, and is generally worse than either. More of the improved cupolas have been condemned and thrown out for want of drawings showing the shape of the lining and directions for keeping it up than for any other cause.

Early Stove Advertising Poetry.

The following letter from the Cleveland Co-operative Stove Company of Cleveland, Ohio, will doubtless be read with interest by many members of the trade:

The recent almost tragic death abroad of the well-known writer, Miss Constance Fennimore Woolson, calls to mind the fact that probably her first literary efforts were in connection with the stove manufacturing business. Mr. Woolson, the father of the celebrated writer, was really the pioneer in the stove manufacturing business in the West. He established himself in a small way in the then village of Cleveland, and met with success. At the time of his death the firm of Woolson, Hitchcock & Carter were among the leading stove manufacturers of the country. After the death of Mr. Woolson and Mr. Carter, one of his partners, the concern was merged into the Franklin Stove Works, who later were succeeded by the present Cleveland Co-operative Stove Company. Almost the initial stove of Mr. Woolson's production was known as the Morning Star, which had a very large sale, and in the advertising of this the first literary efforts of the poetess, then a mere child, were exerted. There were some eight or ten stanzas, which were printed and used by the trade as an advertising medium for the sale of the stove. Among the archives of the old concern have been found only three stanzas, reading as follows:

The Morning Star is all the rage,
Because it suits in every age.
The people come both near and far,
Just to buy the Morning Star.

It suits the farmer's wife, they say,
Because it bakes well every day.
It suits the townsman just as good,
Because it burns so little wood.

If you'd have peace, comfort and bliss,
And at home enjoy each cherished wish,
And shun the rocks and clear the bar,
Then fail not to buy the Morning Star.

A part of the third line of the last stanza quoted is not legible and may not be entirely accurate. Perhaps some of the older stove dealers can supply the missing verses.

ODD PLATES.

THE MAMMOTH counterpart of a nickel plated Garland range which formed the distinguishing feature of the exhibit of the Michigan Stove Company at the World's Columbian Exposition, has recently been placed in an elevated and prominent position in the area fronting the works of the company on Jefferson avenue, Detroit.

THE MANY FRIENDS of E. S. Barbour, president of the Detroit Stove Works, will be interested in learning that his suit against the Wabash Railroad Company for damages on account of injuries received by an accident in a train near Crown Point in May, 1892, has been decided in his favor. The jury were out but a short time and brought in a verdict awarding Mr. Barbour $5000. After the announcement of the verdict the counsel for the defendants stated that an appeal would be taken to the higher courts.

THE MONROE FOUNDRY & FURNACE COMPANY of Monroe, Mich., have sent us a very attractive catalogue relating to the Floral City furnaces, which they manufacture in several varieties. The volume is made up of about 100 pages of letterpress, printed in tinted ink upon good paper and bound in attractively ornamented colored paper covers. The aim of the concern in issuing this publication has been not to enter into an extended discussion of scientific heating and ventilation, but rather to present a few general laws which experience has shown to be practical, and invite a careful investigation of the conspicuous merits embodied in the Floral City furnace. The early pages contain remarks on warming and ventilation, followed by a description of the goods named. Scattered through the volume are half-tone engravings of buildings, public and private, in connection with which the company's goods have been used. Numerous tables are also presented, giving the dimensions and heating capacity of the Floral City furnaces; also capacity of pipes and registers. The latter portion of the volume is given up to extracts of testimonial letters, as well as to a long list of some of the persons using and dealing in the company's goods. The makers state that they have during the past ten years made a special study of the heating and ventilation of churches, school houses and other public buildings, and are prepared to give satisfaction in every case. In addition to the warm air furnaces the company offer the trade a line of combination warm air and hot water heaters, reference to which is made in the pages of the catalogue.

ACCORDING to dispatches to the daily press from Mansfield, Ohio, the most severe wind and rain storm experienced in years passed over that section on the evening of Saturday, April 28. Reports from neighboring towns are to the effect that much damage was done to buildings, trees and fences, and that in Mansfield many structures were unroofed, among them being the Eclipse Stove Works.

ANSON INGRAHAM, one of the oldest and best known citizens of Washington County, N.Y., died at his home in Center Cambridge, April 21. He was born in Pittstown, Rensselaer County, N.Y., in 1811. He went to Center Cambridge 62 years ago and established a general store. His business grew rapidly and he branched out in several enterprises, one being the manufacture of stoves at Troy. Later he became the senior member of the firm of A. Ingraham & Co.

LAST WEEK some interesting experimeents with a straw burning cook stove were made in Minneapolis, Minn. The stove is the invention of D. R. Hoopes, is constructed of sheet steel, and the upper portion does not differ essentially from that of the ordinary coal burning stove. Two fuel doors open from the front, and are intended for the insertion of large cartridges in which the straw, hay, corn cobs or stalks are placed. In general appearance the cartridges must resemble an exaggerated shot gun shell, except that in place of the cap is a small round hole which is used as an upper draft through the shell. On one side of the cartridge is a 3-inch draft, which extends the entire length—27 inches. It is crated from above by three strips of iron, which run the entire length and keep the charge of fuel from falling down into the draft and choking it up. The cartridges are run in on two girders of iron, and with one charge, it is claimed, the stove will run for an hour under ordinary circumstances. The oven is located beneath the fire box or cartridges, and the flame is carried over it down the front of the stove and underneath the oven. The concern which has been formed to manufacture this device is known as the Straw Burner Stove Company, with offices in the Loan & Trust Building, Minneapolis, Minn. At present the stove is being made at the shops of the Peteler Car Works, where the experiments referred to were carried out.

GRANGE SARD of Albany, N. Y., has taken a cottage for the summer at Magnolia, Mass., where he will spend a portion of his time.

THE JAMES SPEAR STOVE & HEATING COMPANY, Philadelphia, are to furnish the ranges for a building operation of 400 houses at Overbrook, Pa.

THE SUPERIOR STOVE COMPANY of Superior, Wis., have had under consideration an increase in the capital stock to $50,000. At the date of latest advices it was the intention of the company to resume operations this week and on a scale which would enable them to fill the orders already booked and take care of those which were expected to follow.

A VERY appreciative article concerning the Culter & Proctor Stove Company appears in the Peoria (Ill.) *Journal* of the 24th ult. The extent of the company's plant is stated, and the character of the goods made is set forth in full. From the general tone of the article the inference is drawn that the company are favored with good business, on which they are to be congratulated.

THE RECENTLY ORGANIZED and thoroughly equipped plant of the Central Stove Works Company of Lebanon, Pa., resumed operations on Monday, April 23, and the first cast was made on

Wednesday, the 25th. The works are now in good shape for business and the company propose turning out a line of stoves which will take a high rank as well as prove very popular with the trade. The officers and management are said to be more than pleased with the favorable start which has been made.

THE MANUFACTURERS' STOVE REPAIR COMPANY of Chicago were recently incorporated, with a capital of $15,000. The incorporators include Oscar Ludwig, William D. Meeker and J. Henry Delms.

OPERATIONS have recently been commenced in all departments of the plant of Zebulon Hunt, at Hudson, N. Y. A reduction of 10 per cent. was made in the molding shop, but as soon as business revives somewhat the old scale, it is said, will go into effect.

THE MOBILE STOVE & NOVELTY WORKS of Mobile, Ala., were recently organized, and the plant will be located on the site of the old cotton mill, at the corner of Theater and Royal streets. The Edgar-Nelson Foundry Company will also be consolidated with the new concern.

THE JOLIET STOVE WORKS of Joliet, Ill., are sending out a neat calendar for the month of May, in combination with which is an illustration of Moore's Air-Tight heater. The stove is shown with and without casing. The text states that in 1891 Moore's Air-Tight heater was an experiment, in 1892 it was an acknowledged success, in the panic year, 1893, the company sold twice as many as in 1892, while for 1894 it is intimated that "it is time for every live dealer who values the agency of a profitable specialty to procure it."

THE PORTLAND STOVE FOUNDRY COMPANY, Portland, Maine, recently purchased a brick building on Kennebec street and propose to open a retail department. One of the latest productions of the company is an aluminum tea kettle, which they are now placing on the market.

THE CRAIG-REYNOLDS FOUNDRY COMPANY of Dayton, Ohio, present in an attractive catalogue, which has just been issued from the press, some remarks relative to the Triumph warm air furnaces which they manufacture. These goods are the result of years of experience and observation and are said to "combine every convenience and improvement that modern inventive genius can devise. They have been constructed with especial reference to heating capacity, durability and economy, as well as common sense principles of sanitary heating and ventilation, and are manufactured with special reference to the economical and thorough heating of residences, churches and schools." The Triumph furnaces are adapted for using hard or soft coal and are made in three sizes, portable form. The Triumph King, likewise arranged for burning hard or soft coal, is made in portable form and also for brick work. It is made in four sizes and has fire pots ranging from 20½ inches in diameter in the smallest size up to 30 inches in diameter in the largest size. The catalogue consists of 16 pages, is neatly printed and is bound in attractive covers.

SAM S. UTTER of 113 Beekman street, New York, has received from his foundry a new oil stove known as the No. 40 Game Lamp. It has a four-hole top and is finished in either plain black or nickel plated. The tank is made in one piece and is regarded as a great improvement over the old style. Mr. Utter appointed on a recent Western trip the following agents in the cities named: Burtis & Co., Troy, N. Y.; C. B. Baker, Cleveland, Ohio; O. K. Stove Company, Louisville, Ky.; Freeman, Delamater & Co., Detroit, Mich.; Jacob Retterer, Chicago; A. J. Lindemann & Hoverson Co., Milwaukee, Wis., and the Maxwell Brokerage Company, Denver, Col. The agent for the Eastern States is H. M. Carey, located at Boston, Mass.

RATHBONE, SARD & Co. have been granted this year two patents on their Acorn radiator, one covering the design and the other the construction. The patents embody the essential features which have made the stove so popular with the trade. The makers, we understand, have no desire to monopolize so important an invention, and have decided to offer to a limited number a license to use the inventions described in letters patent No. 516,617 and covering the constructive features of the stove, but they will not license any one to use their design patents.

THE ELLWOOD GAS STOVE & STAMPING COMPANY of Ellwood City, Pa., have placed on the market a new gasoline stove known as the Perfect Safety. It is a new cheap step stove, made in two sizes, one having two individual burners and the other three in the top surface, and a double burner on the step at the left. The area of the top of the smaller size measures 15 x 22 inches, while that of the larger is 16 x 32 inches, the hight from the floor being in each case 29 inches. The step is 12 x 18 inches in area and stands 22 inches from the floor. These goods are provided with the company's removable automatic shut off Perfect Safety tanks. The stoves are referred to as being light, strong and durable, made of stamped steel throughout, neatly japanned and ornamented.

THE SUPERIOR FURNACE COMPANY of Little Falls, N. Y., are directing the attention of the trade to their lines of specialties by means of a neat folder, lithographed in colors. Illustrations are given of the Superior steel range, which is shown with high closet and reservoir; the new warm air Superior heater with top return flue and adapted for hard or soft coal; the Superior furnace with heavy all cast iron dome and either steel or cast iron radiator, and the Superior dome furnace, intended for using hard or soft coal, coke or wood as a fuel.

THE LITERARY DEPARTMENT of the Michigan Stove Company has favored us with two entertaining poems, daintily gotten up, nicely printed, and altogether captivating. One is entitled "So Different," and illustrates sundry trials in wedded life which were only ended when an investment was made in a Garland stove. The other is entitled "Stoves and Sunshine," and is a eulogy of the Yankee stove by Eugene Field, who versifies his experience in countries unblessed by the heat giving apparatus which is in vogue throughout this country.

R. ROBINSON & SONS, 105 Lake street, Chicago, are agents for the Northwest for the Model steel range made at Portsmouth, Ohio, and have succeeded in establishing a fair trade for it.

F. MEYER & BROTHER COMPANY of Peoria, Ill., have recently engaged in the manufacture of the Weir gas and soot burning furnace for heating with warm air. They have just issued a handbook of hints on warming and ventilation entitled "The House Comfortable." The book contains 48 pages, of which the first 32 pages are taken up with a very interesting treatise on warming and ventilation. The writer is evidently a man of long and varied experience and possessed of a high power of searching investigation, while he is at the same time a master of vigorous English. His illustrations are forcible and always well pointed, and his suggestions are eminently practical. The remainder of the book is devoted to setting forth the special features of the Weir furnace, of which full illustrations are given, portable and brick set, perspective and sectional. Scattered throughout the book are illustrations of buildings in which the Weir furnace is used for heating.

WE HAVE RECEIVED from the William G. Fischer Mfg. Company, Kokomo, Ind., four fine photographs of their Columbian wrought range. One shows the range with a high shelf, another with high shelf and low closet, the third with high closet, while the fourth is a double oven range with high shelf and low closets. A description of this range was given in a previous issue.

THE BUCKWALTER STOVE COMPANY of Royersford, Pa., will this season introduce to the trade the Star Canopy, a five or six hole range, in six sizes. It has a side ash pit, right or left oven door, nickeled name and number plate, elevated shelf, and will be furnished with or without a reservoir. Another new range will be the Bright Canopy, a full six hole range in four sizes. In square heaters they will introduce the Colossus, a high priced stove with full revertible flue and fully nickeled. They will also have ready for the season's trade the Gem Ringgold, a handsomely finished and nickeled cheap square parlor heater; and the Aldine, a sheet iron base burner. Their Laura sheet iron double heater will be somewhat changed and will appear this season with sliding doors.

THE GRANDER STOVE COMPANY of Royersford, Pa., are preparing some additions to their lines for the coming season's trade. In ranges they will introduce the Venus, a six hole range made in two sizes, with and without reservoir, large front ash pit, right hand oven door, pipe shelf and elevated warming shelf. A first-class range in every respect. Another range will be the Mentor, a medium priced article in two sizes, five and six holes, with side ash pit, right and left oven doors, with and without reservoir, and pipe shelf. In heating stoves they will bring out the Milton, a medium priced sheet iron base burner. Their line of Volga square heaters which they put on the market last season will be augmented by the addition of a larger size, to be known as No. 15, made in two parts and heavily constructed. They will make an addition to their line of Mars square heaters by the introduction of a new direct draft and revertible flue single heater. Their Bride range is to be redressed, and will appear with a new skirt and pipe shelf.

THE MOUNT PENN STOVE WORKS of Reading, Pa., will place on the market this season some new goods, among them the Penn Pride, a sheet iron base burning stove, half revertible flue, nickeled base and foot rail, nickeled crown top band and full nickeled swing cover; the Penn Pearl, another sheet iron base burner, with full revertible flue and double foot rail; the Penn

Coin, also a sheet iron base burner, with straight draft and single foot rail; the Penn Prize, a full nickeled square heater, in single and double styles, designed to meet the demand for a cheap square stove. Their line of furnaces will be augmented by the Palace, a steel drum furnace with horizontal hot air flues, and made in sizes running from the size suited to the requirements of a very small house upward. This furnace is constructed to meet the market for an extremely cheap article. They are reconstructing the Penn City, a small five or six hole range with stationary ash pit, and the Penn Item, a small six hole range with detachable hearth. The appearance of these ranges will be much improved.

THE MICHIGAN STOVE COMPANY have prepared a large pictorial hanger which they are now distributing to their customers. It is intended as a time saver, but also answers an excellent purpose as a constant advertisement This hanger is 44 x 27 inches in size and is devoted to the new Garland cooking goods. It shows handsomely engraved pictures of 32 different ranges and cooking stoves manufactured by the company, and thus saves merchants and salesmen the trouble of referring to the catalogue. The hanger is printed in colors, the background being a light blue, around which runs a neat crimson border, while ornamental scrolls separate the nine groups of ranges and stoves from one another. In the matter of cast ranges four styles are shown for each group. In cooking stoves three styles are shown for each group. There are two groups of wrought ranges with three styles in each group. In looking over this array of fine cooking goods the thought naturally occurs that the man or woman who cannot be suited in such a collection must be extremely hard to please.

JOHN P. SCHAFFER, 18 Wood street, Pittsburgh, Pa., manufacturers of the Novelty wall pipe, has just returned from his regular spring visit to the East, where he has been looking after the interests of his goods and purchasing stock for the coming season.

THE NEW YORK OFFICE of the Howard Furnace Company celebrated May Day by a new coat of varnish on the sample of the Howard furnace which is in front of their place at 210 Water street. They will furnish five combination Howard furnaces for some residences in course of erection at Twenty-second and Walnut streets, Philadelphia.

W. G. GREAMER & Co., 96 John street, New York, have in course of completion some new designs in hot air registers which will be ready for the trade during the summer. They make a specialty of brass goods, and show a fine line of tea kettles of ornamental design, such as are used with an alcohol lamp.

W. H. PFAHLER, treasurer of the Abram Cox Stove Company, Philadelphia, made a visit to the New York office at 305 Pearl street this week.

THE FOLLOWING ITEM relative to the extending use of gas stoves is taken from a recent issue of one of the New York dailies: During the last five years a great deal of money has been invested in the perfection and manufacture of gas appliances, and the missionary work which the agents of these different manufactories have been making in the different cities, especially in New York, is beginning to tell. Last summer a large number of apartment houses were fitted up exclusively with gas stoves. These experiments gave such satisfaction that not only apartment house proprietors, but individual renters of flats are making for these conveniences, which secure perfect combustion, the saving of hours of time. money and discomfort. It is estimated that when gas stoves are substituted for the old fashioned coal furnaces the radiant heat of New York will materially diminish, and this is a matter of importance to the many who must live in New York all the year round and in apartment houses provided with a blazing coal stove in each apartment from early morning until nightfall. In London 150,000 gas ranges are already in use, and it is believed that New York will follow the example very quickly.

GASOLINE STOVE MANUFACTURERS have for years been handicapped by the almost universal opinion that gasoline stoves are dangerous, and this opinion has been encouraged by the daily press reports of what are styled "gasoline stove explosions." C. A. Stockstrom, secretary of the Ringen Stove Company, gives a case in point. A few days since an explosion occurred in a dwelling house in St. Louis, where the occupants had a gasoline stove, the explosion resulting in the death of two persons and the serious injury of two others. The daily press heralded the explosion in their usual manner, heading it "Terrible gasoline stove explosion." The facts in the case are as follows: The man of the household had gone out to procure a quantity of gasoline, and had it in a 5-gallon glass jar, with glass handle. Entering the summer kitchen where the gasoline stove was in operation the weight of the gasoline caused the handle to break and the jar falling to the floor broke. An explosion followed, as a matter of course. The gasoline stove was in no way to blame, as had an ordinary cook stove been in use the same explosion would have occurred. It would be well for dealers in whose localities so-called gasoline stove explosions occur to investigate the circumstances, and in nearly all cases the fault will be found, not with the stove, but in the carelessness of the operator.

ONE OF THE NEWEST PRODUCTIONS of the Kernan Furnace Company, Utica, N. Y., is the Kernan range. It is of the double oven variety and is made in three sizes. It is furnished with either a plain, Dockash or duplex grate, and all arranged so that they can be removed through the front without difficulty. The fire chamber is of ample size and fitted with a reversible water back, that can be used on either side of the fire chamber. The ranges are provided with warming ovens and have a handsome high shelf, large flues and free access to them for cleaning being special features. In size and shape the range has been designed to meet the requirements of the New York market.

EXPORTS OF STOVES AND RANGES and parts of the same from the United States to foreign countries during the nine months ended March 31, 1893, were of the value of $178,175, as compared with $161,446 in the corresponding period of last year.

HARRY KING, representative of the Kernan Furnace Company of Utica, N. Y., is making New York City his headquarters while visiting the trade in near by towns. *The Metal Worker* was favored by a call, when his line was shown by nickel plated model and the features explained. The man who sells the goods is always a welcome visitor.

THE BULKELEY is the latest addition to the line of furnaces of the Bulkeley Stove & Range Company, 104th street and Lexington avenue, New York. Those that were in use during the past winter are said to have given excellent satisfaction.

M. ABBOTT'S SONS, Seventeenth street and Eighth avenue, New York, are making a specialty of their hot air furnace business. They have a full line of furnaces on their sample floor which they call the Union. They are provided with a labor saving grate, and the radiator is so constructed as to present a large heating surface and effect an indirect draft.

A. L. CANFIELD, the New York representative of the Danville Stove & Mfg. Company, Danville, Pa., has many attractions for the stove dealer at 284 Pearl street. The company are the Eastern agents for the Monarch gasoline stoves made by the Baxter Stove Company of Mansfield, Ohio, and report a growing interest in this line of goods in New York and vicinity. A display is made of every variety of these stoves from the cabinet Monarch to the low junior. They are also agents for the Model steel ranges, made by the Portsmouth Stove & Range Company of Portsmouth, Ohio, and find that these goods are being shown some favor by the builders in this vicinity. The large flues used in steel range construction enable these goods to prove satisfactory in operation in chimneys where the cast iron ranges with flues of less generous proportions fail to give prompt and satisfactory results. These ranges are provided with all the labor saving devices of high-class goods, and are of very attractive appearance. They have just put on the floor the new Queen Beaver, their highest grade range. In design and ornamentation this range is quite handsome. It is provided with either a triplex or duplex grate, has ventilated oven, cut centers and a top which, they claim, is specially adapted to overcome the breaks frequently occurring in range tops and to maintain a continuously level top. The range is made with ovens 21 and 23 inches square and 13 and 14 inches high. It is furnished with the Waterman or a non expanding cover. It is set on a heavy ornamental base, has a nickel plated top edge and an ornamental nickel plated back guard, to which swinging plate warmers are attached. The 8–16 is a new size added to their line of the King Beaver that has a nickel back guard, and a feature which will be attractive to the housewife is a large and convenient ash pan.

The Ontario Bureau of Mines has received information of a discovery of tin ore which, it is claimed, has been made in the vicinity of Sudbury, Canada.

Early in May will begin the competitive tests of machine guns at the Indian Head proving grounds. Several types will be submitted, including the Gatling, Accles, Maxim, Gardner and others. From these weapons one will be selected for adoption in the naval service, in order to secure a uniform class of guns and ammunition for all the ships. At present two or three styles of machine guns are provided for the navy, there being no standard.

TRADE REPORT.

The Iron Market.

The situation is dominated by the Coal and Coke strikes. So far as the producing interests are concerned the state of affairs is very much mixed. The blast furnaces of the valleys and of the Pittsburgh, Wheeling and Cleveland districts have felt the Coke strike first. Edgar Thomson, Laughlin and Stewart have stock enough to carry them along. The majority of the other stacks have either banked or blown out or will do so within a short time.

Even some of the furnaces in Central Pennsylvania who could use anthracite threaten to bank because it would run up the cost. The anthracite stacks proper will find their capacity reduced when the usual admixture of Coke to the burden is dropped.

In the foundry grades of Pig Iron there has been no stiffening, because until now the Southern plants have kept running. Besides, there is quite a fair stock for the moderate current demand.

As for the strike itself, the general opinion is that the men are hardly in a condition for long idleness. Besides, there is the significant fact that the Flat Top and Cumberland districts, two very large contributors to the supply, are fully at work.

On the other hand, it is conceded that wages in some sections have been unduly low, and it is rumored that some interests in the Connellsville region will grant the demands of the men. A very weak point of the position of the labor leaders is that they will not allow resumption, even if the demands are granted, locally, unless the surrender of the operators has been general.

Pig Iron.—The New York and New England markets have been very quiet and have not as yet been affected in any way by the Coal strike. It is probable, however, that some of the Alabama furnaces will have to bank if the labor situation does not soon improve in that district. In Bessemer Pig we note a sale of 10,000 tons at private terms by an Eastern Steel works. We quote standard brands $12.50 @ $13.25 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10 25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9 75 @ $10.25.

Our Philadelphia representative writes as follows in regard to the Pig Iron market in that district: Foundry Irons are not affected by the strike to the same extent as those used for Steel making, and while there is a fairly good demand, buyers can get almost anything they want at last week's prices. Eventually, however, it will affect both ends of the market, as Pig metal can neither be consumed nor produced without the regular fuel supply, so that what affects one will affect the other. Under these circumstances there is no movement to indicate any decided change in values in either direction, sellers being about as anxious to do business at former prices as they usually are, particularly when the order is from gilt edged parties. Quotations are so diverse that they can only be given in general terms. Some buyers claim to be getting first-class No. 2 Foundry X at very close to $11. delivered at points equal to Philadelphia, while sellers of leading brands claim $12 @ $12.25 as their minimum. The question arises whether the low priced Iron is of the grade represeuted, but as it answers the purpose of the consumer the name or grade is of little account. This is doubtless a temporary condition, and the quotations herewith given are merely a general indication of what sellers ask, rather than as representing actual sales—except in a small way:

Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.75 @ 12 25
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 12.00
No. 2 Soft	10.75 @ 11 00

In the Chicago market transactions in local Coke Iron have been on a little better scale, but Southern Iron shows no improvement whatever. The Coal strike in the South has not yet caused prices to be advanced by the Southern companies, although sales agents are daily in expectation of orders to mark up their rates. Lake Superior Charcoal continues neglected. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10 50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.60 @ 13.50
Southern Silvery, No. 1	@ 11.50
Southern Silvery, No. 2	@ 11.00
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern, No. 2, Soft	9.75 @ 10.00
Tennessee Charcoal, No. 1	15.00 @ 15.50
Tennessee Charcoal, No. 2	14.50 @ 15.00
Alabama Car Wheel	17.85 @ 18.00
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	12.50 @ 13.00

The Coke strike has caused the shutting down of many furnaces in the Pittsburgh district, and has brought about a famine in Bessemer Iron for close delivery, so that it can hardly be had at any price. Buyers are taking only what material they absolutely need, but for such purchases they are paying from 50¢ to $1 advance. Foundry Irons are firmer and for close delivery show a slight advance. For prompt delivery the following quotations are ruling:

No. 1 Foundry	$11.25 @ $11.50, cash
No. 2 Foundry	10.40 @ 10.75 "
No. 3 Foundry	10.00 @ 10.25 "

Sales are noted by our Pittsburgh agent of 25 tons of No. 2 Foundry at $10.40, 25 tons at $10.60 and 50 tons at $10 75, for May delivery.

Advices from St. Louis indicate that the Coal strike has not as yet had any effect on prices in that market, and there seems to be plenty of Iron to fill all orders for the present. Transactions are almost entirely confined to small lots, the largest single sales for the week running up to 300 tons. Quotations are made as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.75 @ $11.00
Southern Coke, No. 2 Foundry	9.75 @ 10.00
Southern Coke, No. 3 Foundry	9.50 @ 9.75
Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel	16.25 @ 16.50
Ohio Softeners	14.25 @ 14.50

Business during the week in the Cincinnati district has been very dull. The only transaction beyond the few current consumption sales, which were inconsiderable, was a sale of 1500 tons of No. 2 Foundry, and this was made on the basis of $675, f.o.b. Birmingham, and for long forward delivery. Consumers in the district have about all the Pig Iron they require in the early future under contract, and there are few applications from the East or elsewhere for new supplies. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

There has been no change in Pig Iron prices in the Louisville, Ky., market as a result of the Coke strike. Furnaces are, however, not inclined to sell heavily until they see the effect upon the Iron industry of the disturbances in the coal fields. Among Pipe shops, Car shops, and Stove foundries there is yet great complaint of the low prices finished materials have to be sold at. Quotations, for cash, f.o.b. cars Louisville, Ky., are as follows:

Southern Coke, No. 1 Foundry	$10.25 @ $10.50
Southern Coke, No. 2 Foundry	8.75 @ 9.25
Southern Coke, No. 3 Foundry	8.50 @ 8.75

Metal Market.

Pig Tin.—There has been a sharp rise in prices and more activity in business. Even the speculative branch of the trade has been infused with a little animation, making, in all, a condition of affairs somewhat in contrast with the flatness that prevailed up to within a very recent date. At the end of last week dealings were recorded to the extent of 150 tons at 19.75¢ @ 19.85¢ spot, 19.67½¢ May delivery, 19.67½¢ June, and 19.70¢ September. On Tuesday the interest became livelier and carried prices still higher in the face of a bank holiday in London. Sales were recorded to the extent of 75 tons at 20.05¢ @ 20.10¢ for May delivery, 19.95¢ for June, 19.95¢ for July and 20¢ for August, while as high as 20⅛¢ was bid for spot. In the latter there was a clean advance of 0.42½¢ from the lowest point of the week, and the distant futures moved up to the extent of about 0.30¢ during the interval. The feeling was somewhat quieter later in the week, but offerings at less than 20.15¢ were the exception on either prompt or future delivery. Prices for small lots of the metal are unchanged at last week's quotations—namely, 21¢ @ 21¼¢ per lb for Straits Pig, with an advance of 1¢ per lb in Bars.

Copper.—The market is rather weaker in appearance. Offerings of Lake Su-

perior Ingot at 9½¢ have not met with response except where very small quantities were involved. Fair sized lots offered at 9.45¢ found very limited outlet and poor results attended efforts to draw out bids of 9.40¢ on larger quantities. As not unusual on a soft market, rumor had it that still lower prices were not out of the question, since the European market has not netted over the parity of 9¼¢ for some time past. Electrolytic apparently stands in rather better position, since home purchases continue on a fair scale and 8¾¢ @ 9¼¢ cover the extremes of prices. Casting stock has not varied from 9¢ @ 9⅛¢ in price, but finds merely routine sale. Jobbing business in both Ingot and Manufactured Copper has been unusually limited in extent, while prices are inclined to be soft.

Pig Lead.—There has been slightly freer offerings by some producers. Speculators who carried a few carloads since early in the year unloaded also. Both movements came just at a time when consumers were very indifferent buyers. Between them they forced prices lower and for a time gave the market a weak appearance. About five carloads went at 3⅜¢. That, however, disposed of the liquidation. Subsequent bids of the price named were ineffective in leading to business, and 3.42½¢ @ 3.45¢ would now seem to be strictly inside rates for Western brands. Bids of 3 40¢ were refused. Nothing more than a routine business is doing and consumers evince little interest beyond the supplying their absolute needs. Jobbers' prices for small quantities of American Pig rule at about 3⅞¢ @ 4¢ ℔ lb.

Lead Sheet and Pipe.—The market for Plumbers' Supplies in this vicinity is extremely dull. Building operations in hand are so limited and those in prospect are so uncertain that the demand for this class of material has fallen far below the average. This condition of things, however, seems to be more or less local, as reports from other sections of the country are much more favorable. Prices for Lead Pipe and Sheet Lead, while nominally maintained, as per list, can without much difficulty be shaded.

Spelter.—Since our last report a good portion of late accumulation in the West has been disposed of. This and the fact that production has been reduced considerably served to stiffen prices and give the market better tone. Eastern consumers, however, have purchased in a moderate way and are indifferent buyers at the present time. On good Western brands the popular quotations are 3.55¢ @ 3.60¢ for delivery here or at common point, with an advance of about ¼¢ ℔ lb on small lots from store.

Tin Plates.—No improvement can be noted in the demand for any line of Plates. The market appears soft as well as peculiarly dull for this season of the year. Orders run quite as small as they did a week ago, and are not more numerous, although some dealers mention a slightly increased interest in future deliveries. On the whole, the market is commonplace and business disappointing. The first days of each month usually bring in to the dealers an accession of orders from the smaller trade, but nothing of the kind has occurred at this time. The demoralization of the trade is attributed on all hands to the uncertainty existing in regard to the tariff. Stocks are in such a shape that when that question is settled, or in a fair way to be so, the chances are in favor of a good movement of business. Shipments from Europe continue comparatively small, and stocks on this side, both in and out of bond, are lower than has been the case for years. Importers find it cheaper, under present conditions, to carry their purchases of Plates on the other side, sending over for them as they may be needed. Even some of the larger consumers are leaving portions of their purchased stocks in bond at American ports and drawing from them gradually according to their requirements. Prices are inclined to weakness, concessions being easily made on desirable orders. A London cable dispatch to *The Iron Age*, dated May 2, reports on the British market as follows: The Tin Plate market remains dull, although there has been rather more doing in 14 x 20 Cokes for prompt shipment. Prices continue low and rather weak. Stocks at Swansea are now about 257,000 tons. Shipments latterly have been heavy. Good orders reported for Black Plate. Liverpool quotations are as follows:

IC Charcoal, Alloway grade.....12/ @ 12/6
IC Bessemer Steel, Coke finish. ...11/3 @ 11/6
IC Siemens " " " .....11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20.....Nominal.
Charcoal Terne, Dean grade.....10/3 @ 10/6

Sheet Iron.—Some good sized orders have been placed for Black Sheets, and others are said to be in prospect. The mills are reported as being well supplied with work, some of them for as long as 60 days ahead. Jobbers, however, complain of an absence of life in this line of trade, the fact being that the tendency to purchase even small quantities of Sheet Iron direct from the mill instead of through the dealer is becoming more pronounced, Both in Black and Galvanized Iron there is, at present rates, but a very slim profit for the jobbers, many of whom delare they would sooner not handle the material at all. A very active demand exists for Black Iron of light gauge for trimming purposes. Galvanized Iron moves somewhat heavily. Prices are, however, fairly well maintained. Some good export orders for Galvanized Sheets for Cuba have been lately filled.

Aluminum.—A reduction has been made in the price of Ingot Metal in ton lots from 55¢ to 50¢ ℔ lb for No. 2 grade, and from 60¢ to 55¢ for No. 1 grade. The base price of Aluminum Sheet has been reduced from 90¢ to 80¢ ℔ lb; Aluminum Wire Rods from $1.20 to 90¢ ℔ lb. and Nos. 9 to 14 gauge Wire from $1.25 to $1 ℔ lb.

Chicago Report.

Scrap.—Transactions are very limited. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5⅛¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3⅛¢

Anthracite.—Thus far the Western miners' strike has had no effect on the hard Coal market. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5 25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6 55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

The Sheet Iron Trade.

The coal miners' strike has proved a source of great trouble and annoyance to rolling mill operators and other manufacturers throughout Ohio. When the strike was announced every manufacturer did everything possible to secure a supply of coal and some were successful. Among the number, and probably the most fortunate, is the Cambridge Rolling Mill Company. This concern own their own coal mine, and in consequence now have several thousand tons in sight. At Bridgeport natural gas has been resorted to, although a strong effort was made to induce the Ætna-Standard miners to go in at an increased rate of wages. Other mills have moderate supplies on hand which they are using very carefully, running only the finishing departments by using up accumulated stocks of partly finished material. This trouble brings to notice once more the wonderful vitality of the sheet iron end of the rolling mill industry. As soon as mills commenced to shut down, buyers of sheets, particularly roofers, were on the road looking for a place that could supply immediate wants, and with few exceptions large consumers of sheets are asking for quicker deliveries. Several mills have sold their products up to July 1 and others can see enough business in sight to keep things moving until that time.

The little spurt of business among iron and steel roofing concerns which was referred to recently is now confirmed. The best proof of this is that roofers' stocks are running lower than they have during many months.

THE BELLEFONTE BOILER WORKS, W. T. Maitland, proprietor, is the subject of an extended notice in a recently issued industrial edition of the *Keystone Gazette* of Bellefonte, Pa. The specialty of this enterprise is the manufacture and repair of all kinds of steam boilers, stacks, tanks and sheet iron work generally.

E. C STEARNS & Co., Syracuse, N.Y., in connection with their plant, in which a large variety of goods are manufactured, have a large foundry equipped in the best manner and are in excellent position to furnish Gray Iron Castings for other manufacturers.

CONDITION OF THE

Hardware Trade.

DURING APRIL the demand was somewhat spasmodic and uneven. The month opened with trade that was somewhat disappointing, but the last half of the month showed a perceptible improvement. On the whole the aggregate of business was fair. May opens without any special change in the general situation, a good many orders coming in from the trade, but mostly for small quantities. In the matter of prices the market continues weak, although it is a question whether or not in many lines the bottom has been reached. The low price of raw material, the reductions which have been made in wages, and the economies to which manufacturers resort in the production of their goods, have the effect of diminishing costs to a point considerably below that of former years, and the desire on the part of manufacturers to keep their works in operation has the effect of inducing them to make such concessions in prices as will enable them to market their goods. There is consequently in many lines a gradual shading of quotations. This is not confined to manufacturers, but the jobbers also desiring to hold their trade and dispose of their stocks are offering inducements in the way of low prices. The fact that many retailers who are careful buyers are purchasing in unusual y small quantities prevents them doubtless in many instances from obtaining as low quotations as are within their reach. The probable duratiou and effect of the coal strike is being regarded by the trade with much interest, and its effect is already slightly felt on some goods which lie near the raw material, inasmuch as it induces an element of uncertainty, in view of the fact that if long continued it would produce a scarcity of fuel and cause the shutting down of works. Some manufacturers are therefore disposed to ask slightly advanced prices on some lines, but the trade are not as yet disposed to pay any increased price. The general anticipation is that May will be characterized by a fair but not heavy trade.

Advices from Chicago.—Now that April has ended and a comparison of the volume of business in Shelf Hardware can be made, it is found that the aggregate for the month was but a trifle under that of March. The early part of April was a quiet period, but business picked up considerably during the latter half, which accounts for the excellent showing now made, and yet the condition of business in Shelf Hardware is by no means what it should be. In some cases this spring it has been necessary to considerably decrease the force of salesmen. Wire Cloth has firmed up during the week, and jobbers are now trying to get $1.50. Prominent manufacturers are withdrawing all quotations. Jobbers further West are advising the Chicago trade that they are prepared to follow their lead in putting prices up. Heavy Hardware shows no special improvement, but fair inquiry is noted for Carriage Makers' Supplies. This branch of trade is in a different condition from previous seasons. Contracts are usually placed early in the year by carriage manufacturers, but this season they have not done so, and consequently they are purchasing stock steadily from week to week.

Notes on Prices.

Wire Nails.—The market is scarcely as active as it has been, but there is still a good demand. In the matter of prices there is a somewhat improved tone, and manufacturers are disposed to withdraw some of their extreme quotations, particularly on the ground of the uncertainty as to the duration and effect of the coal strike. On the whole, however, the market remains in substantially the same condition as at our last report, being represented by the quotation of 95 cents for carload lots at factory, a figure which still can probably be shaded. Small lots from store in New York are held at $1.15 to $1.25.

Advices from Chicago.—The early part of last week prices were in a seriously demoralized condition. Some manufacturers became apprehensive as stocks slid up in their warehouses, and they made strenuous efforts to unload them. Later in the week, however, the situation changed materially. The coal famine began to have its effect, and when it was seen that some of the largest concerns would very shortly be obliged to shut down for lack of fuel the Nails in warehouses began to look more valuable. Prices have consequently stiffened, and, as usual when this takes place, inquiries become larger and specifications on old orders came in more freely. Quotations on factory lots now range from $1.05 to $1.10, Chicago, and if the coal strike does not soon end they will go higher. Stocks in dealers' hands have been pretty well run down, and are in such condition now that an advance by manufacturers will immediately be responded to by the jobbers, who for the present are quoting small lots from stock at $1.10 to $1.15.

Cut Nails.—There continues to be a fair but not heavy demand for Cut Nails, and the market, on the whole, is in about the same condition as last week. The Eastern mills are holding up prices pretty steadily, the principal disturbing factor being the entrance into Eastern territory of Western Nails, which are being offered and to some extent sold in Baltimore, New York, Philadelphia and other points through the Middle States. The Western price is represented in a general way by the quotation of 90 cents for carload lots at mill, but this is shaded 5 cents and in some cases more, especially when placing Nails in Eastern territory. The price of Nails delivered in New York is 95 cents to $1 base, small lots from store being quoted regularly at $1.10 to $1.15.

Advices from Chicago.—Manufacturers report a falling off in orders since last report and some weakness in price, owing to competition from factories in other districts. The local makers continue to quote factory lots on a basis of 95 cents, Chicago, for 55 cent average. Jobbers are holding small lots from stock at $1.05 to $1.10.

Barb Wire.—There is a perceptible falling off in the demand for Barb Wire. There is, however, a fair business still doing. The irregularities in price to which we have referred still continue, and while the market is represented by the following quotations for Four Point Galvanized, delivered at the points named, it is not unlikely that they could be shaded: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2 20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—Manufacturers report a very good condition of business with some sections of the West, which keeps their order books in fair shape. The demand is particularly good from the Southwest. Business latterly has picked up to some extent with the Northwest, but orders from this section have seldom exceeded carload lots, being mainly for lots of two to three tons. Prices are unchanged at about $2.15, Chicago, for factory lots of Galvanized Barb Wire and $2.30 to $2.40 for small lots from jobbers' stock.

Plain Market Wire.—A fair but not especially heavy business is being done in Plain Market Wire, and prices continue as they have been for some time, low and somewhat uneven, the competition between the mills being active. Base sizes are being sold at $1.30, f.o.b. mill, with proportionate advances for the small sizes. Galvanized is regularly quoted from ½ to ⅝ cent advance, but in some cases it is bought at $\frac{4}{10}$ cent advance, there being an apparent tendency to diminish the extra.

Hawthorne Julep Strainer.—Manning, Bowman & Co., Meriden, Conn., are putting on the market this Strainer, which is sold to the trade at $8 per dozen, subject to a discount of 25 per cent.

Adjustable Bathtub Seat.—This Seat is put on the market by the St. Louis Bronze & Aluminum Works, St. Louis, by whom it is sold from the following list, subject to a discount of 35 per cent. to the trade:

No. 1, nickel plated, ash wood bottom with oil finish	$3.50
No. 2, black enameled	2.50

Columbian Screw Plate.—This article is put on the market by Alfred Ely & Co., Baltimore, Md. The discount to the trade on the Screw Plate is 33⅓ per cent.

Simplex Cork Puller.—The Simplex Cork Puller, manufactured by Manning, Bowman & Co., Meriden, Conn., is sold at $21 per dozen, subject to a discount of 25 per cent. to the trade.

Cordage.—There are rumors of some changes in the management of the United States Cordage Company, and of other negotiations looking to the securing of harmony in Cordage interests. As a result of this and other influences the market is firmer and a slight advance has been made in price. The market is now represented by the quotation of 6½ cents for Manila and 4½ cents for Sisal in large lots, f.o.b. factory or New York, subject to the cash discount of 1½ per cent. The trade are placing their orders more freely than for some time in view of the possibility of still higher prices.

Glass.—Prices and conditions in the Glass market remain without change as reported last week. There appears to be no scarcity of the smaller sizes of Glass, but enough to carry the trade until fall. Desirable sizes of larger Glass, it is understood, are sought after, and the lack of sufficient quantity to supply future demand may ultimately result in a larger use of Plate Glass as a substitute. It is reported that the factories in operation represent a capacity equivalent to 1054 pots, which shows an increase of about 50 pots during the past month. Pittsburgh prices are reported as follows: In small quantities by jobbers, single strength, 80 and 10 per cent.; double strength, 80 and 10 and 5 per cent. discount. Factory prices are given as 85 per cent. discount for single and 85 and 10 per cent. discount for double strength Glass. Plate Glass remains firm at 70 and 10 per cent. discount.

Old Metals.—Old Metals are not in quite as good demand as they were a

week or two ago. Inquiries are moderate, but enough business is done, particularly in certain descriptions of Scrap Iron, to keep prices fairly steady. The following quotations represent about the present dealers' buying prices in this city:

Heavy Copper	℔	lb	7½¢
Light and Tinned Copper	℔	lb	6½¢
Heavy Brass	℔	lb	5½¢
Light Brass	℔	lb	4½¢
Lead	℔	lb	3¢
Tea Lead	℔	lb	2¢
Zinc	℔	lb	2¾¢
No. 1 Pewter	℔	lb	14¢
No. 2 Pewter	℔	lb	7¢
Wrought Scrap Iron, ℔ gross ton		$9.00 @	....
Heavy Cast Scrap, ℔ gross ton		7.00 @	....
Stove Plate Scrap, ℔ gross ton		4.50 @	....
Burnt Iron, ℔ gross ton		3.00 @	3.50

Old Rags, Paper, &c.—The market for Paper stock is moderately active, but prices remain at their former level. The following are the ruling prices, New York delivery:

No. 1 White Rags	℔	lb 3¼ @	3⅓¢
No. 2 White Rags	℔	lb 2 @	2¼¢
Mixed Rags	℔	lb	1¾¢
Blues and 3ds	℔	lb 1 @	1¼¢
Hard Sized White Shavings	℔	lb 2¼ @	2⅓¢
No. 1 White Book Shavings	℔	lb 1½ @	1⅝¢
No. 2 White Book Shavings	℔	lb 1 @	1⅛¢
Light Book Shavings	℔	lb	¾¢
No. 1 Mixed Shavings	℔	lb ¾ @	1 ¢
No. 2 Mixed Shavings	℔	lb ½ @	¾¢
No. 1 Printed Books	℔	lb 1 @	1¼¢
Ordinary Mixed Books	℔	lb ¼ @	¾¢
Newspapers	℔	lb 2-5 @	½¢
No. 1 Manila Paper	℔	lb 1 @	1⅛¢
No. 2 Manila Paper	℔	lb ⅝ @	¾¢
Bogus Paper	℔	lb	⅛¢
Common Paper	℔	lb	¾¢
Straw Chips	℔	lb	1/8¢
Binders' Clippings	℔	lb ½ @	⅝¢
Jute Butts	℔	lb 1⅞ @	2 ¢
No. 1 Jute Bagging	℔	lb 1 @	1¼¢
Mixed Bagging	℔	lb ¾ @	1 ¢
No. 2 Bagging	℔	lb ½ @	¾¢
Hemp Twine	℔	lb 2 @	2¼¢
Manila Rope	℔	lb 2⅛ @	2¼¢
Jute Rope	℔	lb 1¼ @	1¾¢
Mixed Rope	℔	lb ¾ @	⅞¢

Old Rubber.—The market for Old Rubber is fairly active. Prices rule about as follows, but are subject to variation and are somewhat irregular:

Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03⅓
Rubber shoes, less than carloads, ℔ lb.	@	.03⅓
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

Trade Notes.

METCALF & MORRISON, 126 and 128 Polk street, Newark, N. J, are a new firm of iron founders making both light and heavy Castings for the trade in the foundry formerly occupied by Rupp & Son.

UNDER DATE of April 13 Randall & Becton, 110 Boylston street, Boston, Mass., manufacturers of the Merrill Aluminum Heater, notify the trade that Wm. H. Goss retires from the firm and is succeeded by R J. Gordon.

THE ADVERTISEMENT of the Excelsior Steel Furnace Company of Cbicago which appears in this issue treats of the subject of Boots. The company manufacture Boots of all sizes and all kinds for use at the bottoms of furnace stacks. Those who take the trouble to clip the coupon in the advertisement will find it worth $1 to them on their first order for such goods amounting to $10 or more.

THE SPRINGFIELD COIL BOILER COMPANY, 48 Hampden street, Springfield, Mass., in an announcement elsewhere in this issue direct attention to the Springfield Coil Boiler of their manufacture. The apparatus is shown brick set, and also with casing removed, so its construction is readily understood.

AVERY STAMPING COMPANY, Cleveland, with their extensive and well equipped plant, advise us that they are in a position to do all kinds of Tinning and Retinning of Steel or Copper and, in fact, all metals. The company will be pleased to furnish estimates to any one desiring to have Tinning or Retinning work done in large quantities.

THE FAIR HAVEN MARBLE & MARBLEIZED SLATE COMPANY, Fair Haven, Vt., have a card in our advertising columns this week directing attention to Slate in all forms for plumbers' use, such as urinal stalls, sinks, closet slabs, basin slabs, &c.

THE ANNOUNCEMENT elsewhere of Savill, Walls & Co., 1229 Budden street, Philadelphia, Pa., will be of interest to the plumbing trade, as it directs attention to Savill's Closet Connection for new, old or broken closets.

THE PAGE ANNOUNCEMENT of the Iron Clad Mfg. Company of 22-24 Cliff street, New York, is of more than usual attractiveness this issue. It tells of the Iron Clad Enameled Ware, the merits it possesses and the popularity it has won, and the illustration is a picture of a train of freight cars loaded with Iron Clad goods made for the Fair. An entire train load of such articles means an enormous quantity for a single shipment.

THE ADVERTISEMENT elsewhere of John A. Scollay, 72, 74 and 76 Myrtle avenue, Brooklyn, N. Y., directs attention to the Scollay Hot Water Heater of his manufacture, and points out the purposes to which it is specially adapted.

THE SECURITY GAS & VAPOR STOVE COMPANY, St. Louis, Mo., in an announcement elsewhere call attention to the merits of the Security Gas Range, which is described as new in construction and new in design.

S. BLUMENTHAL & Co., Thirty-eighth street and Eighth avenue, New York, are making a specialty of the Kernan furnace, made by the Kernan Furnace Company, Utica, N. Y. They report a good business and very satisfactory results from the furnaces in use during the past winter.

THE PETEREIT MFG. COMPANY have been incorporated in New York State, with a capital of $5000, to manufacture metal and other goods in New York City. The directors are: Albert H. Petereit of New York City, Olin F. Gleason of Arlington, N. J., and Doane N. Gleason of Brooklyn.

The present week witnesses the trials of the first two war vessels built at American navy yards for many years. These are the second class battle ships "Maine" and "Texas," the first named built at New York and the latter at Norfolk. The "Maine" will undergo her official horse-power trial and the "Texas" the dock trial of her engines. Both these vessels are built to develop 8500 horse-power, which, it is calculated, should give them an average speed of at least 15 knots an hour. It is not expected that the "Maine" and "Texas" will be ready for active service much before the end of the year.

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Metal and Miscellaneous Prices.

CHICAGO, MAY 3, 1894.

Tin—

Straits pigs.....21¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Celyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.35
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100℔	.5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	.11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@ .....
IC, 20 x 28	.12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	.15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$18.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal extra, IC, 14 x 20..... 7.25
Merion, IC, 14 x 20..... 7.00
Almond, IC, 14 x 20..... 6.50
Mint, IC, 14 x 20..... 6.25

Coke Plates.—Bright.

Elwood —IC, 14 x 20.....$6.00
IC, 20 x 28.....12.50

Roofing Plates.

Palm, IC, 20 x 28.....@$11.25
Palm, IX, 20 x 28.....@ 14.00
Empire, IC, 20 x 28.....@12.00
Empire, IX, 20 x 28.....@15.00
Hickory, IC, 20 x 28.....@ 12.50
" IX, 20 x 28.....@ 15.50
Alaska (heavily coated), IC, 20x28@$14.50
Alaska IX, 20 x 28.....@ 17.75
Special, IC, 20 x 28.....@ 15.00
" IX, 20 x 28.....@ 18 00

Westmoreland:

IC, 14 x 20..... $6.00
IC, 20 x 28..... 12.00

Elwood:

IC, 20 x 28..... $11 50

Furmston:

IC, 20 x 28..... ...$11.00

Juno:

IC, 14 x 20..... $5.75
IC, 20 x 28..... 11.50

Illinois, Old Method:

IC, 20 x 28.....$17.00

E. L.:

IC, 20 x 28.....$12.50

Jessie:

IC, 20 x 28.....$12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20.....$9.50

Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00

Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28.....19.00

Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28.....22.00

Neville, Stamped, IC, 14 x 20..... 6.25
" " IX, 14 x 20..... 7.50
" " IC, 20 x 28.....12.50
" " IX, 20 x 28.....15.00

Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared).....$9.50

Taylor's Old Style, IC, 20 x 28 (Stamped and Resqnared).....19.00

Taylor's Roofing, IC, 14 x 20 (Stamped and Resqnared)..... 8.25

Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared).....16.50

Columbia, IC, 14 x 20 (Stamped)..... 7.25
" IC, 20 x 28 (Stamped)....14.50

Maple, IC, 14 x 20 (Stamped)..... 6.75
" IC, 20 x 28 (Stamped).....18.50

Willow, IC, 14 x 20..... 6.50
" IC, 20 x 28.....13.00

Knoxall, IC, 14 x 20..... 6.25
" IC, 20 x 28.....12.50

Globe, IC, 14 x 20..... 6.00
" IC, 20 x 28 .....12.00

Miami, IC, 14 x 20..... 6.00
" IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
" (Redipped), IC, 20 x 28.....17.00

Old Process:

IC, 14 x 20..... 9.25
IX, 14 x 20.....11.25
IC, 20 x 28.....18.50
IX, 20 x 28.....22.50

H. B. L., Old Style:

IC, 14 x 20..... 7.75
IX, 14 x 20..... 9 25
IC, 20 x 28.....15.50
IX, 20 x 28.....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	8 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10¼¢; B, 9¼¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.... dis.75@77½%

Copper—

Ingot.

Lake.....10½¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list, 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.33
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... 4¢

Sheet Zinc—

600 ℔ casks.....4.50¢
300 ℔ casks.....4.70¢
Loose sheets..... 4.80¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10¢
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....13¢
Hallett's.....12¢

Wrought-Iron Pipe—

1¼ and under, Plain	60&10%
1¼ and under, Galv.	52½&10%
1½ and over, Plain	70&10%
1½ and over, Galv.	60&10%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ 2 ¢.
" " Brown	℔ 1½¢
" " Purple	℔ 2½¢
" Ground in oil, B. Red	℔ 6½¢
" Ground in oil, Red	℔ 6½¢
" Ground in oil, Brown	℔ 5½¢
" Ground in oil, Purple	℔ 6 ¢
Linseed Oil, Boiled, in bbls	50¢
Linseed Oil, Raw, in bbls	47¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal.	34¢
Spirits Turpentine, in bbls., ℔ gal.	34½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.75
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, MAY 4, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	℔ 75¢
100-℔ lots	℔ 73¢
Ton lots	℔ 70¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	℔ 65¢
100-℔ lots	℔ 60¢
Ton lots	℔ 55¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	℔ 60¢
100-℔ lots	℔ 55¢
Ton lots	℔ 50¢

Antimony—

Cookson.....℔ 10¾¢
Hallett's.....℔ 9¾¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¾ in. up to 2 in	$0.35
⅝-in. up to ¾-in	.36
½-in. up to ⅝-in	.38
⅜-in. up to ½-in	.41
5-16-in. up to ⅜ in	.48
¼-in. up to 5-16-in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 19, inclusive,	.38

25 @ 30%

Copper and Bronze Tubing—

8¢ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ℔, net

Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9¼¢
Planished.....net
Sheet and Bolt.....15¢ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ 2.50	2.80¢
Nos. 17 to 21	℔ 2.60	2.90¢
Nos. 22 to 24	℔ 2.70	3.00¢
Nos. 25 and 26	℔ 2.80	3.10¢
No. 27	℔ 2.90	3.20¢
No. 28	℔ 2.95	3.30¢
American B. B	℔ 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ 11½@12½¢
Patent Planished....℔ A, 10¢; B, 9¢ 5%
Craig Polished Sheet Steel.....℔ 8½¢

Galvanized.

	B. B
Nos. 10 to 16	75@75&10%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3½¢@4¢
Bar.....4½¢
Pipe.....5¾¢, 20%
Tin Lined Pipe.....15¢, 20%
Block Tin Pipe.....37½¢, 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7⅛
Lead, Red, bbls. and ⅛ bbls	6⅛ @ 7
Lead, Red, kegs	6⅛ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2⅛
Linseed Oil: Raw, ℔ gal.	@ .40
Boiled	@ .43
Spirits Turpentine: In bbls	@ .32
Putty: In barrels and ½ bbls	.01⅝ @ .01¾
In tubs	.01¾ @ .01⅞
In tin cans	.01⅞ @ .02⅛
In bladders	.01⅞ @ .02¼
Roofing Material, &c.: Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔	.2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra.	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained.
Rosin, C. & D.....₱ bbl. $1.23@$1.24
Rosin, E. & F..... .. ₱ bbl. $1.30@$1.50
Rosin, G. & H. .....₱ bbl. $1.70@$2.00
Rosin, I. & K.....₱ bbl. $2.30@$2 60
Rosin, M. & N.....₱ bbl $2.90@$3.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr.....$3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. 1 Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼..... ..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₱ ℔.....3½¢
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔.....4¢
5 % slp.

Yager's Soldering Salts.
¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔.....21¾¢
Straits, pigs, ₱ ℔.....21¢ @ 21¼¢
Straits in bars, ₱ ℔.....22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... .... 5.50
" " IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20 .... 5.50
Columbia, IC, 14 x 20..... ..... 7.00
Dane, IC, 14 x 20 ..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... .. 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... ... 5.75
Extra Central, IC, 14 x 20.... .....5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28..... .....11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redlipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... ..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20 .... 6.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.25
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28..... ....15.00
Newcastle Real Old Method, IC, 14x20, 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" IX, 14x20....7.62½
Neville, IC, 14 x 20..... .... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redlipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palaclo, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... 10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redlpped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20 ....5.37½
Vigilant, IC, 14 x 20 ....5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20.....11.00
Merlon, IC, 14x20.. ..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. .. 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20.... .... 7.25
Versailles, IC, 14 x 20 ....5.75
Youghlogheny, IC, 14 x 20... ... .6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$7.50
20 x 28..... 15.00
IX, 14 x 20..... .... 8.75
20 x 28 ....17 50
Pontymister Grade, IC, 14 x 20..... 6 50
20 x 28.....13.00
IX, 14 x 20. .. 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28..... 11.50
IX, 14 x 20..... 6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20..... $5.37½
20 x 28.....10.70
IX, 14 x 20..... 6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10.50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.

Melyn and Calland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7 00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
"	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.
Steel Coke.—IC, 10x14, 14x20 $5.25@$5.35
10x20..... 8.12½
20x28.....11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates—

IXX, 14x26..(112 sheets).....$13.85
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List..... 25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz.... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.. .....52½&10&5%
1½ and over, Plain..... .....70&10&5%
1¼ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1882..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892..... .....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks..... ..... ₱ ℔ 4½¢
Per ℔.....5¢ @ 5¼¢

It Is Reported—

California.

That Fred. Barcoft's Hardware store at MADERA was destroyed by fire on the 20th ult.

Illinois.

That Charles Weber of MILLINGTON is erecting a two-story building which, on completion, will be occupied by his Hardware business.

That Willis & Bender, at LEE CENTER, have disposed of their Hardware store to Harvey Hulbert, who will continue the business at the old stand.

That the store of William Houseworth, MASON CITY, is now being conducted by Paul Enlows, who has purchased the business.

Indiana.

That Sumner & Heffner's Hardware store, at HILLSBORO, was entered by thieves on the 19th ult., but little of value was secured.

Iowa.

That Charles Betler is considering the advisability of opening a Hardware store at PRAIRIE CITY.

Kansas.

That J. C. Guinn, GREAT BEND, has disposed of his stock of Hardware to I. N. Woodward.

That George Smies has purchased an interest in the Hardware business of Keener Bros., CLAY CENTER, and hereafter the firm will be known as the Keener Bros. Hardware Company.

Massachusetts.

That in a large fire at MARLBORO on the 25th ult., the store of W. H. Hill suffered damage to the extent of $2500.

That E. A. Buck & Co., dealers in Hardware, &c., PALMER, are to move into larger quarters about July 1.

That J. R. Todd & Co., WARREN, who recently purchased the Stove and Tin store of W. A. Putnam, have given up the business and removed to Natick.

That a two-story storehouse is being built at NORTH ADAMS, which on completion will be occupied by J. M. Darby.

Michigan.

That Jilbert & Lang have opened their new Hardware store at HOUGHTON. A tin shop will be run in connection with the store. Mr. Jilbert will manage the business. He was formerly connected with the firm of Mondlock & Yagle of HANCOCK and also with J. Pearce at DOLLAR BAY.

That the store of the Phillips Hardware Company, at BLISSFIELD, was burned out on the 23d ult. The loss is estimated at $1500.

Minnesota.

That thieves entered K. Anderson's Hardware store, at LAKE BENTON, on the 18th ult., and carried off a small quantity of Firearms and Knives.

That James Becker has purchased the Hardware stock of Wm. Thoman of HOKAH.

That a partnership has been formed between C. A. Smart and Frank Butler in the Hardware business at AUSTIN.

That the Hardware firm of Clark & James, at ORTONVILLE, have dissolved. Mr. James will continue.

That Mr. Johnson, in the Hardware business at WYKOFF, has sold out to Mr. Boyer of FOUNTAIN.

That Phelps & Co. have succeeded Byron D. Wilson, Hardware merchant, at EXCELSIOR.

That the Martin Company, Hardware merchants, YOUNG AMERICA, are going out of business.

That Heogh & Qually are successors to Charles Heogh at SPRING GROVE.

That Lord & Pokornosky are conducting the business formerly carried on by Jno. Pokornosky at SILVER LAKE.

That Bryant & Andrews, Hardware dealers, MONTICELLO, have sold out to M. B. Bryant.

Missouri.

That J. H. Bockhorst, ST. LOUIS, has removed from 1324 Franklin avenue to 1220 Franklin avenue, where he has a much larger and more convenient store.

That E. Bueltman, ST. LOUIS, has repurchased his old Hardware and House Furnishing Goods store located at Fifteenth and Monroe streets.

Montana.

That the Bee Hive Hardware Company of DILLON have sold out to G. W. Dart.

Nebraska.

That Harrington Bros. Hardware store, at PAWNEE CITY, was burglarized of $60 worth of goods on the 16th ult.

That Taylor Bros. of MINDEN have opened a new Hardware store at TRUMBULL.

New York.

That George S. Pierson & Son of CORNING have disposed of their Hardware store to James Kiff of COVINGTON.

North Dakota.

That F. C. Walter, dealer in Hardware at MINTO, is disposing of his business.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

MOUNTERS on gas ranges, also sheet iron workers. J. A. Coot & Son, 41-45 Adams street, Brooklyn, N. Y. May 5

A first-class STOVE MOUNTER for fine work; permanent job if satisfactory. "S. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

At once, good all round TINSMITH with some knowledge of plumbing; to steady, industrious man a steady job will be given; state wages expected, experience, and give name of last employer. E. A. Burbank, Berlin, N. H. May 5

Thoroughly competent man to take entire charge of a factory making plumbers' supplies and specialties, in brass, bronze, &c.; must be able to handle men, turn out goods economically and accurately figure costs; all communications will be considered confidential; give age, experience, &c. "Factory No. 5," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

One or two good PLUMBERS and a first-class TINSMITH accustomed to general work; state wages required. G. E. Adams & Co., Glen Falls, N. Y. May 5

Two good STOVE MOUNTERS and a PATTERN FILER. "Kentucky," office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. May 5

FOREMAN for cornice and skylight department; one capable of taking charge of outside as well as inside work; to a good man a good job at fair wages is offered. Disley & Weyand, Waterbury, Conn. May 5

A FOREMAN in a large manufactory who is capable of taking charge of help and can figure cost of work from plans; must be a thorough sheet metal worker in galvanized iron, tin, brass and copper. "N. J., No. 55," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

A TINNER; a man who can tin cast iron; must know how to make and apply composition; state wages wanted. "Tinner," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

A young man as ASSISTANT to FOREMAN in a largely cornice shop in New York; must be practical and steady; good chance for advancement for an industrious man; state experience and expectations. "Honesty," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

At once, a first-class sanitary PLUMBER, STEAM and HOT WATER HEATER; state experience and wages expected. W. H. Stoyle, Huntington, L. I., N. Y. Apr. 28

SITUATIONS WANTED.

By a competent man with ten years' experience at tin, sheet iron and copper work, hot air furnaces, steam and hot water heating and plumbing; can estimate on work; have had charge of a shop; best of references; wages moderate. H. M. Hoffman, 14 Sixth street, South Minneapolis, Minn. May 5

By a man who has worked at tinning, plumbing, roofing, iron railings and fire escapes, also has had experience as hardware clerk and traveling salesman; no objections to going West; Cincinnati preferred. Edwin Weisenborn, 36 Third street, Brooklyn, N. Y. May 5

A steady job in or near New York by an experienced TIN and SHEET IRON WORKER; reference if necessary. J. J. McClintock, 402 Washington street, Hoboken, N. J. May 5

As helper to a tinsmith; three years' experience. William Roberts, 2702 Eighth avenue, New York City. May 5

By an experienced PLUMBER; city or country. Patrick Kelly, 72 Navy street, Brooklyn, N. Y. May 5

By a practical TIN and SHEET IRON WORKER and CORNICE and SKYLIGHT MAKER; inside and outside work; wages moderate; best of references. Joe Farber, 2 Mill street, Yonkers, N. Y. May 5

By a PLUMBER and GAS FITTER in city or country; wages $2.75 per day. Albert Dorer, 491 Tenth avenue, New York City. May 5

By a first-class TINSMITH and GENERAL JOBBER at inside or outside work; city or country. John Phillips, 154 Madison street, New York City. May 5

By a young man 26 years of age as PLUMBER, STEAM and GAS FITTER; steady, sober and honest; has full license from Department of Public Works, certificate from the Examining Board of Plumbers and one from the Board of Health; capable of taking charge of men and estimating; also of taking charge of books; can speak German and English. "J. E. K.," care of Jos. Hollander, 75 Avenue D, New York City. May 5

By a practical TIN and SHEET IRON WORKER, 25 years of age, who learned his trade in Germany; two years' experience in this country; steady position desired, city or country; single; state wages. Louis Kreutzman, 199 Forsyth street, New York City. May 5

By a practical TINSMITH in all branches of the trade; good milk can maker; can do jobbing of all kinds; used to country work; sober and steady; country work preferred. F. M. La-Seur, 552 Broome street, New York City. May 5

A first-class PLUMBER, STEAM and HOT WATER FITTER wishes a steady job in city or country. C. E. McPartland, 64 Carmine street, New York City. May 5

By a practical TINSMITH and PLUMBER with ten years' experience at both branches of the trade; can furnish the very best of references regarding character, ability, &c. "J. R.," Sidney, N. Y. May 5

In a boiler or sheet iron shop to lay out and work sheet iron; best of references. Chas. Osborn, General Delivery, Brooklyn, N. Y. May 5

As TINNER or SALESMAN in a hardware store; 14 years' experience; temperate, married and good references. B. F. Anderson, Mitchell, S. D. May 5

By a practical TINSMITH ROOFER who also understands plumbing and gasfitting and general jobbing; 22 years of age; city or country. Louis Katz, 62 Catharine street, New York City. May 5

By a boy 18 years of age, where he could learn the plumbing trade. "F. J. L.," Box 16, Hawley, Pa. May 5

By an experienced TIN and SHEET IRON WORKER who is accustomed to furnace and range work, general jobbing, roofing, &c.; steady position desired: city or country. Ed. Williams, 344 East Thirty-second street, New York City. May 5

By a first-class STOVE MOUNTER; steady and sober; accustomed to all kinds of work; distance no object. "Stove Mounter," Pottstown, Pa. May 5

By a good, experienced TINSMITH at inside and outside work; used to country work; willing to work city or country; strictly temperate. S. Klinberg, 258 Delancey street, New York City. May 5

By a first-class cornice cutter and maker as FOREMAN or CUTTER; middle aged man. "Schmid," 223 East Eighty-ninth street, New York City. May 5

By a good CORNICE MAKER and CUTTER; long experience; good references; wages fair. "Cornice Cutter, No. 55," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

By a first-class PLUMBER. Jas. P. Hayes, 529 East Eighty-third street, New York City. May 5

By a TINNER; first-class assortment worker; will work in any large city. "T. P.," office of *The Metal Worker*, Bank of Commerce Building, St. Louis, Mo. May 5

By a practical TINNER and PLUMBER; 16 years at trade; German; married; can give references as to ability, &c. "Willy," care of A. Maass, 339 East Twenty-second street, New York City. May 5

By an A1 HARDWAREMAN and first-class SALESMAN of several years' experience; thoroughly posted on builders' and general hardware, house furnishing goods, stoves and implements of all kinds; reference from previous employers; 27 years of age. S. Caston, 54 Fourth street, Troy, N. Y. May 5

By a first-class PLUMBER who has a fair knowledge of tin and sheet iron work; eight years' experience; good reference. "R.," P. O. Box 975, Rochester, N. Y. May 5

By a BRASS MOLDER, 14 years' experience on plumbers' supply and valve work; understands the mixing of all metals; capable of taking charge. D. Norman, 214 South street, Boston, Mass. May 5

By a young man, 26 years of age, with 7 years' experience at tin and sheet iron work and plumbing; best of references. "J. J.," 16 High street, Woburn, Mass. May 5

A first-class PLUMBER, STEAM and HOT WATER FITTER would like to engage with some party now in business or about to go in the line of plumbing, steam and hot water fitting, by the year or on a percentage of the profit; will make a trial of one or two months; thoroughly posted on plans and specifications; strictly temperate; will go to any part of the country. B. J. Parker, Station A, New York City. May 5

By a practical TINSMITH, used to all kinds of city or country work, furnaces, ranges, stoves, tin roofing, gutters, &c., iron pipes, pumps and general tin and sheet iron work; 20 years' experience; references; temperate. J. Wallace, Flushing, L. I. May 5

SALESMAN thoroughly acquainted with the stove, range, gas and oil stove line; six years' experience; New York City and suburbs preferred. Box 77, Stapleton, S. I. May 5

As PLUMBER or ASSISTANT plumber; a steady position; regular habits and willing to work; recently graduated from the plumbing department of the New York Trade School. "C. J. O. H.," 391 Bridge street, Brooklyn, N. Y. Apr. 28

SALESMAN with trade in the furnace and range business in New York City and New England is open for engagement; reference. "D. L. C.," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

A SHEET IRON and TIN WORKER; No. 1 mechanic at all kinds of work—heating, ventilating, railroad, ship, mines, cornices, jobbing and assortment; would like a job in good shop; sober and reliable; will go to any part of any country required; steady job at moderate pay. "Guarantee," office of *The Metal Worker*, 96-102 Reade street, New York City. Apr. 28

By a first-class PLUMBER in all branches of the trade; city or country. "R. K.," 167 Avenue A, New York City. Apr. 28

In some mill or factory where an active man of middle age can bring his knowledge of mechanical drafting and general machinery to some use; best of refereuces; moderate salary. Geo. H. Ball, 1318 Pine street, Philadelphia, Pa. Apr. 28

Practical PLUMBER and STEAM FITTER would like to learn from parties wishing to add or develop plumbing and heating business; can make plans and estimates for the several branches of the trade; will work by the day or on commission; can furnish complete set of plumbing and tinning tools. Box 244, Harriman, Tenn. Apr. 28

By a practical CORNICE and SKYLIGHT WORKER, also RAISER, 12 years' experience in this country. John Weier, 1378 Avenue A, New York City. Apr. 28

A young man, 19 years of age, would like to get a chance to learn the plumbing trade; has worked nearly a year in a country shop as helper at general jobbing; a good chance the main object; best of references as to character and honesty. J. E. Bump, Farmington, Maine. Apr. 28

By a first-class TIN and SHEET IRON WORKER on in and outside work; understands working from plans; steady work desired. L. Goldstein, 113 East Houston street, New York City. Apr. 28

A first-class FITTER desires work in a country town; will guarantee to give satisfaction; steady; can do galvanized iron pipe fitting. "G. R.," 189 First avenue, New York City. Apr. 28

As CORNICE MAKER by an experienced workman; works from detail. Bernard Winter, 239 Second street, New York City. Apr. 28

By a good TINSMITH: accustomed to all kind of work; willing and obliging; city or country; moderate salary. H. Cohen, care of Marcuze, 117 Broome street, New York City. Apr. 28

By a TINNER, 23 years of age, with five years' experience in shop work, roofing, spouting and general jobbing; strictly temperate; country preferred; first-class reference. Henry Bailey, Tully, N. Y. Apr. 28

By an ELECTROPLATER of 30 years' experience upon work of every description with all solutions; also polishing, buffing and fancy coloring and oxide work, hand and lathe burnishing. "Electroplater," 18 Schaefer street, Cleveland, Ohio. Apr. 28

By a foundry foreman, as FOREMAN or MOLDER in an iron or brass foundry; have held similar position; capable of handling a good number of men; well acquainted with engineering, machinery and the building trade; general jobbing; good references; temperate. Thomas Wathen, Box 33, Walden, N. Y. Apr. 28

By a BRASS FINISHER; eight years' experience. A steady, sober young man wants a steady situation. Geo. Faris, 524 Morris street, Philadelphia, Pa. Apr. 28

By a first-class PLUMBER; country preferred. Patrick Dervin, 147 Amsterdam avenue, New York City. Apr. 28

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Notice is hereby given that John B. Fisk of the Borough of Hightstown, in the County of Mercer, State of New Jersey, has this day made an assignment to the subscriber, of his estate, for the equal benefit of his creditors, and that the said creditors must exhibit their respective claims under oath or affirmation, to the subscriber at his store, on Main street, in said borough.

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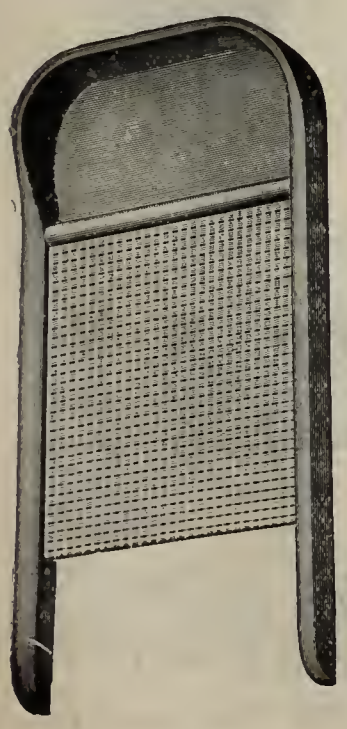
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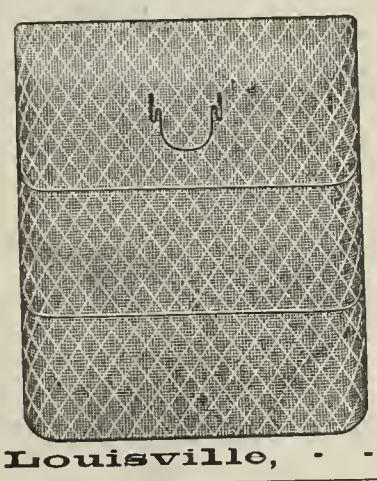
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Some Odd Town Names.

The maps of the United States show that the first settlers of many of the towns and cities must have been at a loss for names, says the New York *Herald*. Everybody has heard of Red Dog and You Bet in California, and Yuba Dam has been accorded a line in history, but when it comes to Dog Tooth of Illinois, Flea Hill of North Carolina, and Fly Mountain of Ulster County, N. Y., their existence would never be imagined unless noticed on a map or in a gazetteer. But there are many other places with names just as striking—Bobtown, Pa.; Bug Hill, N. C.; Chewtown, Pa.; Cut Shin, Ky., and Fiddletown, Cal., for instance. Or if these are not sufficient there are Fussville, Wis.; Daddy's Creek, Tenn.; Calfkiller, in the same State, and Big Foot, in Indiana.

Ohio has a Belle Center, Iowa a Calliope, Indiana a Lily Dale, West Virginia a Little Wild Cat. Maryland a Maiden's Choice, South Dakota a Minnehaha, Wyoming a Miser, Pennsylvania a Nazareth and Illinois a Prettyman. There are others, such as Young Blood, Ill.; Young Womanstown, Pa.; Whisky Town, Cal.; Ty Ty, Ga.; Big Neck, Ill., and Black Jack flourishes in Mississippi, Kansas, Arkansas and Tennessee. To reach Bliss one has to go to Wyoming County, N. Y., and the only State that has a Bird In Hand is Pennsylvania.

—It Required Brains.—A man from one of the back counties of the Upper Peninsula was leaning on the counter talking to the clerk at the Russell House.

"Fine hotel you've got here," he said, shaking a hayseed out of his whiskers. "I keep a hotel myself, but 'tain't nothin' like this."

The clerk smiled and nodded complacently.

"Just the same it takes brains to run it," he went on. "Man in this business can't know too much."

"The public says we hotel clerks do," returned the clerk modestly.

"Yes, I know; but that's pokin' fun at you. I say you can't know too much. Frinstance, in my case now. Last week a guest come to my place and registered himself as a United States Senator. Now, if I hadn't knowed all about the power and dignity and 'fluence of a Senator, I would 'a' got left. But I was posted, and I throwed the house open to him; sent drinks up every night, cocktails every morning; give him the run of the bar durin' the day; set out the cigars; took him out in my best livery rig to see the town and the chance the Government had for improvin' our river and givin' us a public buildin', and kept him there on the fat of the land for four days and never said a word about pay. If I'd been ignorant I'd as like as not sp'iled the whole business, but I wasn't, you see."

"What State was the Senator from?" inquired the clerk.

"Arizony."

The clerk gagged and got red in the face.

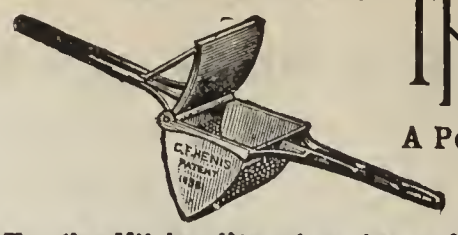
"Arizona?" he repeated.

"Yes, Arizony; don't you know where that is?"

"Of course, of course," replied the clerk; "but Arizona is no State. It's a territory and doesn't have any Senators, at all."

"Wha—wha—what?" gasped the visiting hotel keeper, and the clerk explained and then got down a book and proved it to him and the Upper Peninsulate tore up and down the office awhile, and finally went away and drowned his sorrow in the flowing bowl.—*Detroit Free Press.*

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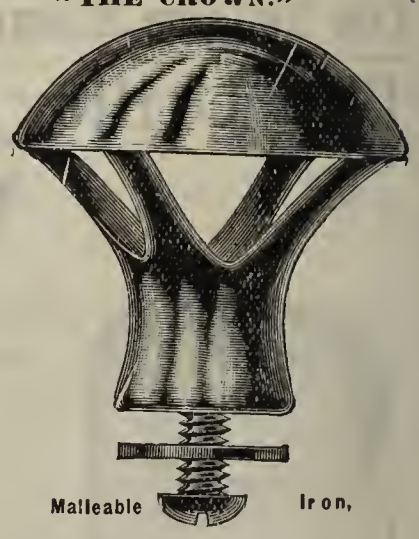
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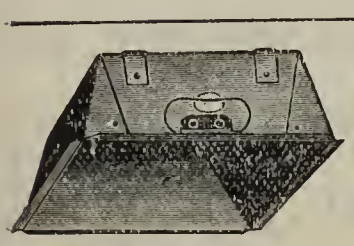
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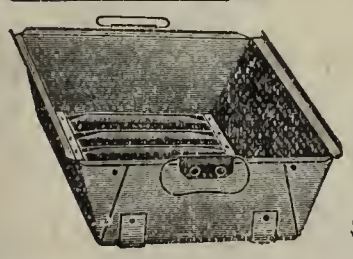
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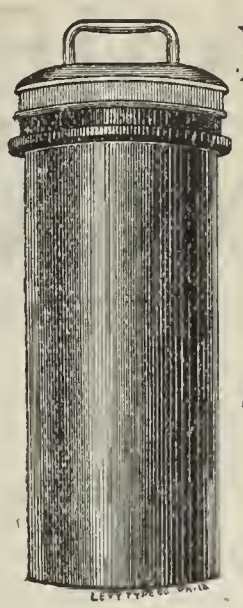


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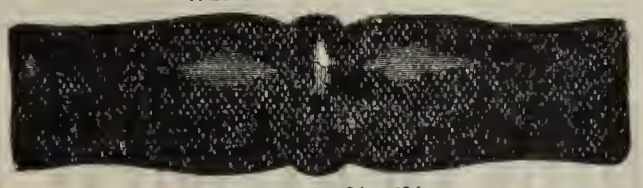
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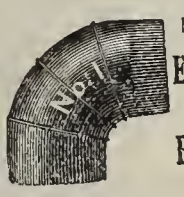
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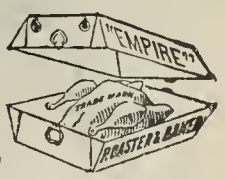
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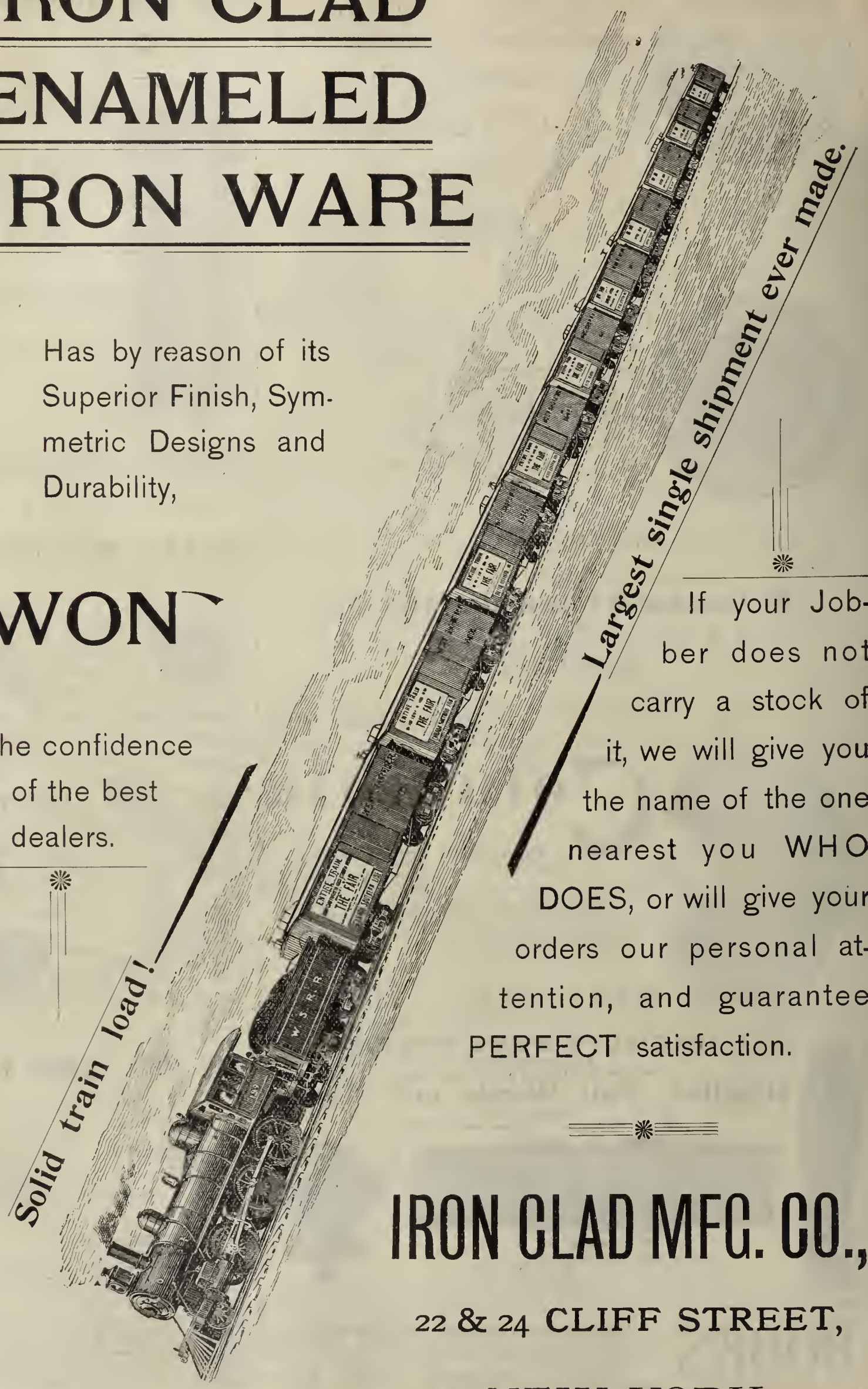
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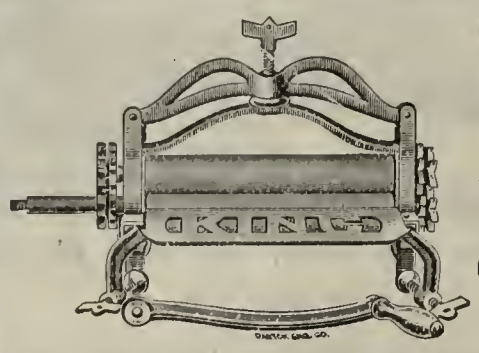
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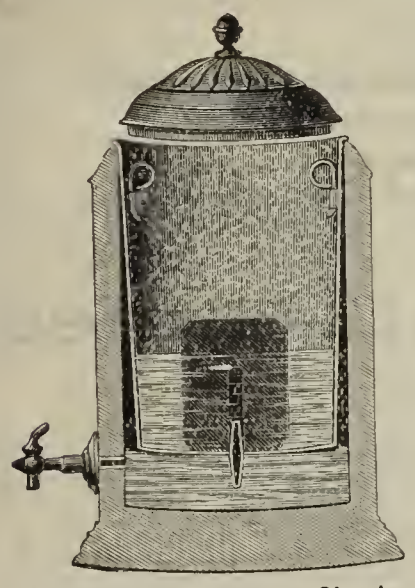
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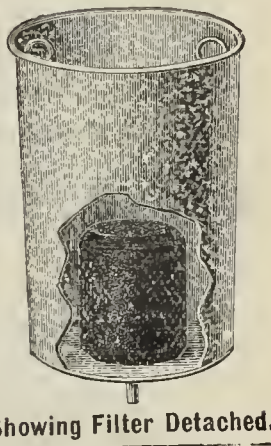
Sectional View of Cooler Showing Filter in Position.

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Japanned or Crystal, each,	$4.50	5.00	5.75	7.00	8.50	10.50	14.50
Extra Heavy—Japanned, with side handles, each,	$6.00	6.50	7.50	8.75	9.75	12.00	16.50

Filter Cylinders Only, Fitted with Carbons.

GALLONS—	2	3	4	6	8	10	14
Each,	$2.50	2.75	3.00	3.50	4.00	4.50	5.50

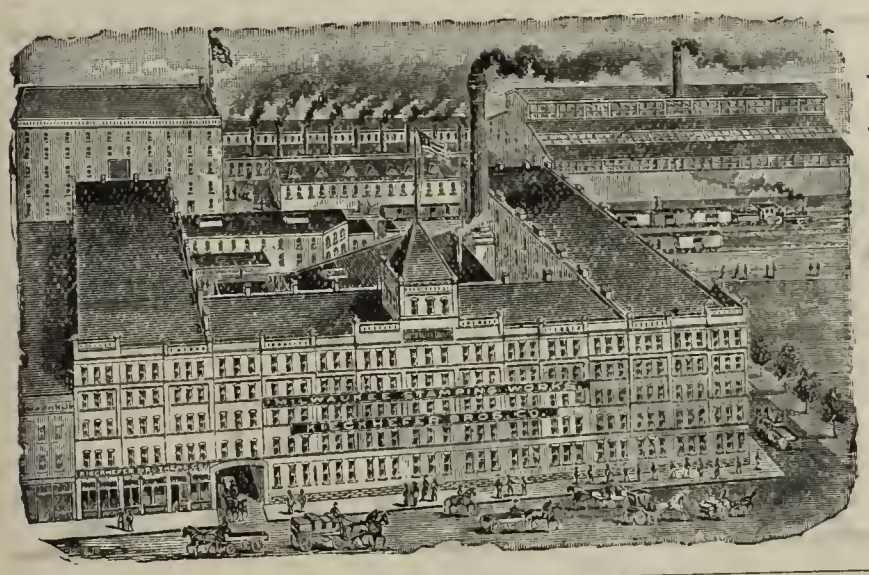


Showing Filter Detached.

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PROPRIETORS OF THE

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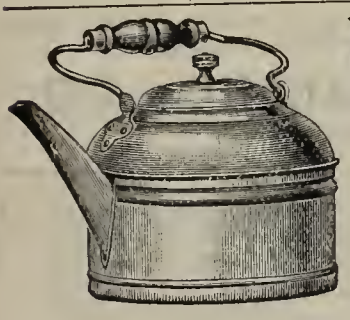
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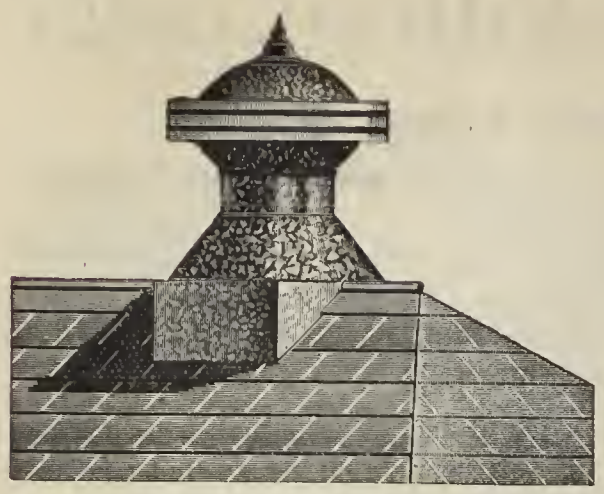
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RANGE KETTLES and NICKEL PLATED COPPER TEA and COFFEE POTS.



THE ROME Tea Kettles are full size and weight of metal. Have seamed in spouts that cannot be melted off. Handles of one piece of wire running through the wood. These goods are the best and cheapest on the market.

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Send for Special Pamphlet on Ventilation.

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VEDDER PATTERN WORKS,
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Dressed and Boarded or in the Rough.

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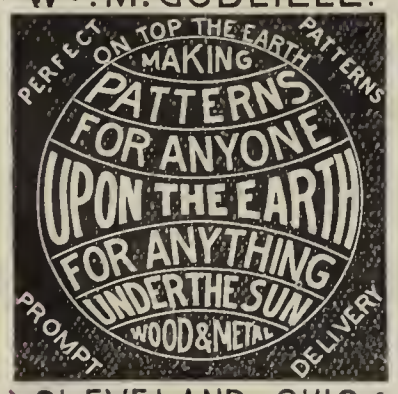
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Makes hard sledding, but the Foundry using our **Radiant Facings** has no difficulty in securing business, because the castings are much better in every way. Send for catalogue and sample.

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Our repairs are sure to fit, as they are all made from manufacturers, original patterns

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A. G. BRAUER.

PERHAPS YOU DON'T KNOW
RUTLAND LINING
FITS ANY STOVE
AND IS CHEAP.

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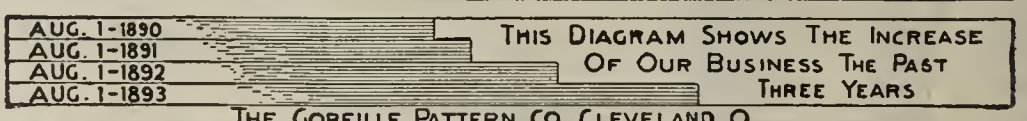
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Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

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Stove, Range & Heater Repairs

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Agents of THE GLOBE VENTILATOR CO.,

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Stove Trimmings, Knobs, Hinge Pins, &c. ☞Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods.☜

The sample tells the story!

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Is the Latest and Best Flour Sifter on the Market.

SOME OF ITS ADVANTAGES ARE:

That it is operated with one hand instead of two.
It is done with a natural motion of the hand.
It has a cover and does not scatter the flour.
It has an agitator that will not grind foreign substances through the wire netting.

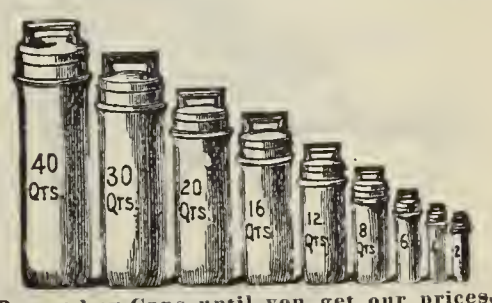
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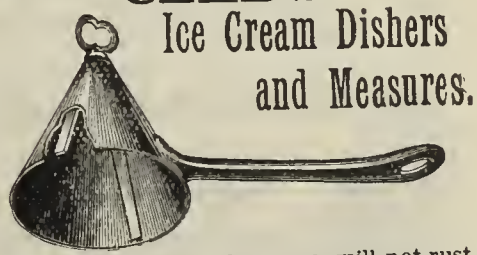
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Ice Cream Dishers and Measures.



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Bob: "How's that?"

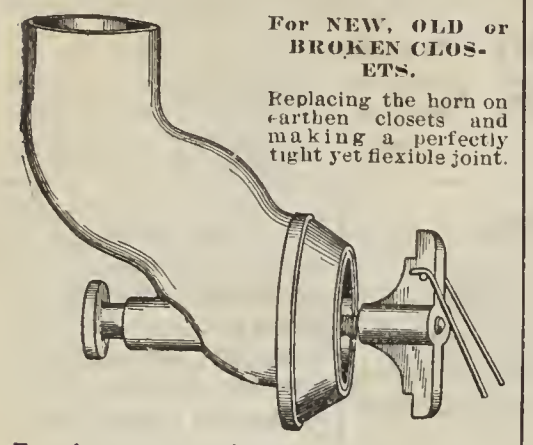
Ned: "When I look at my bank account I think I'm poor, and when I look at my wife's clothes I think I must be rich."—*Chicago Record.*

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The Agent of the Standard Line: "Yes, ma'am."

Mme. Newriche: "And I insist upon having a smooth passage, no matter what the cost."—*Chicago Record.*

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For NEW, OLD or BROKEN CLOSETS.

Replacing the horn on earthen closets and making a perfectly tight yet flexible joint.

For Lead and Iron Pipe in Bent and Straight Styles.

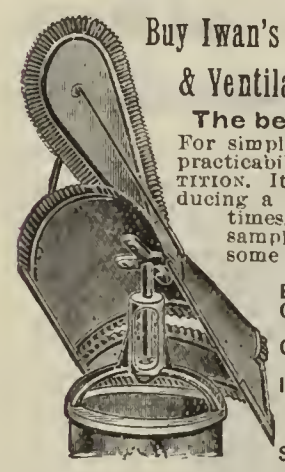
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Best Eave Trough Fastener in the World.
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Successors to CHAS. BODY,
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The best in the World
For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.
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Principles and Practice of Plumbing.

By S. STEVENS HELLYER. With illustrations. 294 pages, price $1.25. Sent on receipt of price by

DAVID WILLIAMS. - Publisher & Bookseller,
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— TEACHER: "Emma, what do you know of the orchid family?"

Emma: "If you please, madam, mamma has forbidden us to indulge in any family gossip."—*Fliegende Blatter.*

— MRS. YOUNGMA: "And so my baby got the prize at the baby show? I knew he would. It couldn't have been otherwise?"

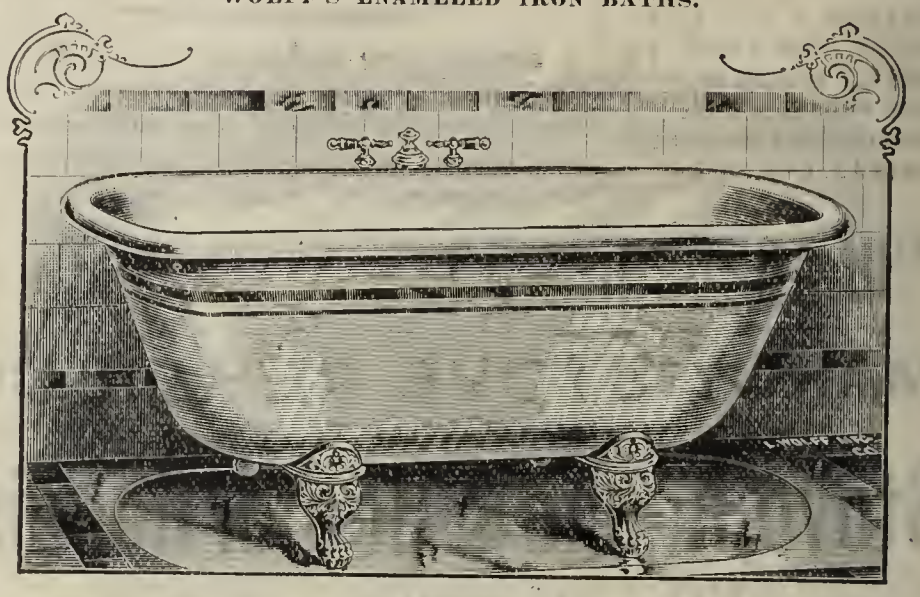
Old bachelor (one of the judges): "Yes, madame, we all agreed that your baby was the least objectionable of the lot."—*New York Weekly.*

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PLUMBING GOODS.

GENERAL OFFICES, 93 West Lake Street, Chicago.

WOLFF'S ENAMELED IRON BATHS.



B-63.

Samples of our make Enameled Goods may be seen at our

SHOW ROOMS: 91 Dearborn St., CHICAGO; 1533 Blake St., DENVER, COLO.; 11 N. Washington Ave, MINNEAPOLIS, MINN.

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SHOWING SAFETY SPRING.

Rain Water CUT-OFF.

For turning the water into or off the cistern.

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Urinal Stalls, Laundry Tubs, Sinks, Closet Slabs, Basin Slabs, Floor Slate, Building Slate.
Slate in all Forms also Slate Mantels.
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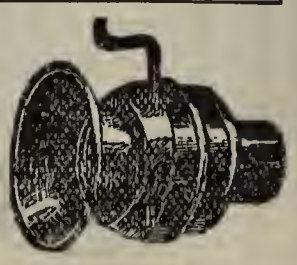
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Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.

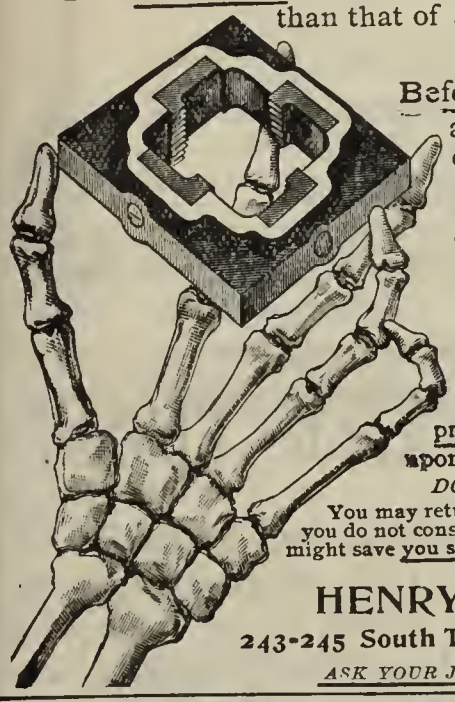


Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

1

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

A sample **One-inch "Skeleton" Pipe Die,** either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you **62 cents,** and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

HENRY B. PANCOAST & CO.,

243-245 South Third St., Philadelphia, U. S. A.

ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.



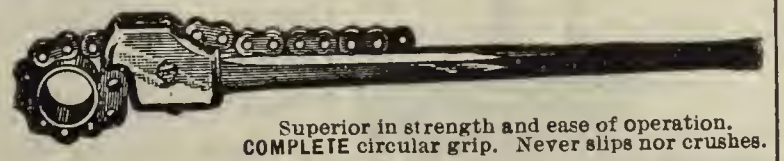
TRIMO PIPE WRENCH.

Forged Steel.

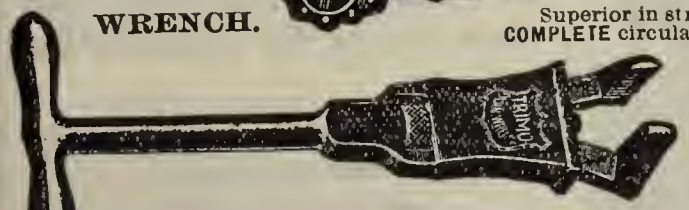
All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

TRIMO CHAIN PIPE WRENCH.



Superior in strength and ease of operation. COMPLETE circular grip. Never slips nor crushes.



Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.

TRIMO BASIN WRENCH.

TRIMONT MFG. CO., ROXBURY MASS.

The "Boyd" Basin.



Made in Ivory Body and all styles of Decoration.

THE ACME OF SANITATION.
HAVE YOU SEEN IT?
IF NOT, GET POSTED.

We Will Post You.

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BROUGHTON'S PATENT SELF CLOSING BASIN COCK

EVERY ONE WARRANTED

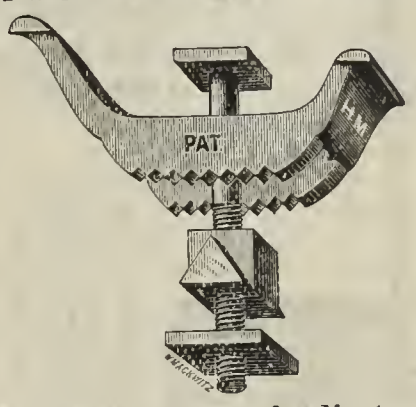
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SOLE MANUFACTURERS.

Mueller's Patent

BASIN CLAMP.

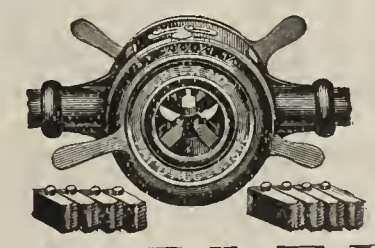


Has greatest range of adjustment. Will fit any bowl. Will not slip.

H. MUELLER MFG. CO.,

Write for Prices. DECATUR, ILL.

All Goods Marked H. M.



DUPLEX DIE STOCK.

COSTS MORE BUT!

Lasts a lifetime and doesn't require strength of a giant TO WORK IT.

THE HART MFG. CO., - CLEVELAND, O.

— TOO LIBERAL WITH IT. — "Ya'as, Cholly gave her a piece of his mind when he met her."

"It must have been a very small piece, then, if he has any left."—*The Press.*

BATH - - TUBS

All Shapes, Sizes And Sorts.

—

Bailey-Farrell Mfg. Co.,

PITTSBURGH, PA.



The Kelly
Self-Acting Frost-Proof After-Flush Closet.

For Extreme Cold Places and Out of Door Work.

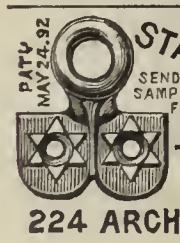
When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

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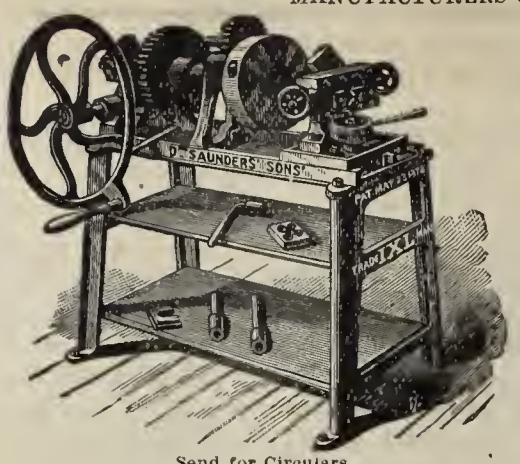
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Manufacturers of Permanent Plumbing Goods.



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MANUFACTURERS OF THE ORIGINAL



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TRADE **I. X. L.** MARK

Pipe Cutting and Threading Machine.

Beware of imitations. None genuine without our Trade-Mark and Name.

STEAM AND GAS FITTERS, HAND TOOLS.

Also, Patent Wheel Pipe Cutters.

AS SHOWN BY THE CUT.

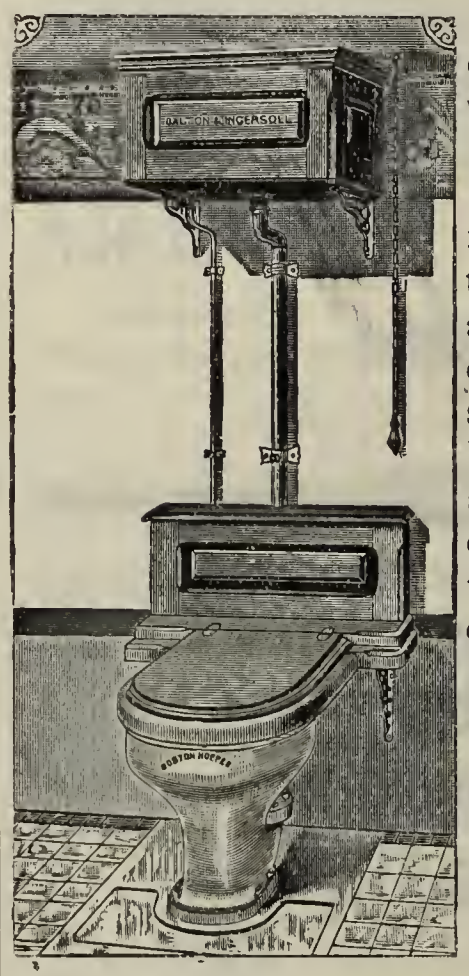
Pipe Cutting and Threading Machines for Pipe Mill Use a Specialty.

27 Atherton St., Yonkers, N. Y.



BOSTON HOPPER WATER CLOSET.

(TRADE-MARK.)



Considered the perfection of closets. It is a modification of what is known to the trade as a Short Hopper and Trap combined. Its exterior outline is in pedestal form, which gives perfect support to the bowl. This construction will allow the seat to rest directly on the closet, dispensing with the use of seat legs, if so desired, allowing a better opportunity for cleaning around the closet. This feature of construction will recommend itself to those looking for simplicity and cleanliness.

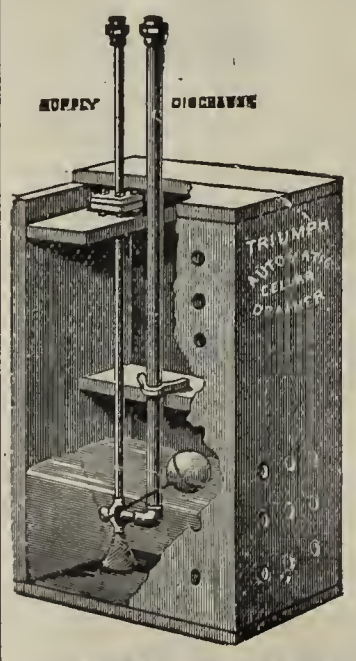
[See our advertisement next week for sectional view.]

—MANUFACTURED BY—

Dalton-Ingersoll Co.,

Wholesale Dealers in Plumbers' Supplies,

171, 173 & 175 High St. (Fort Hill Square).
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A SURE CURE

—FOR—

WET CELLARS.

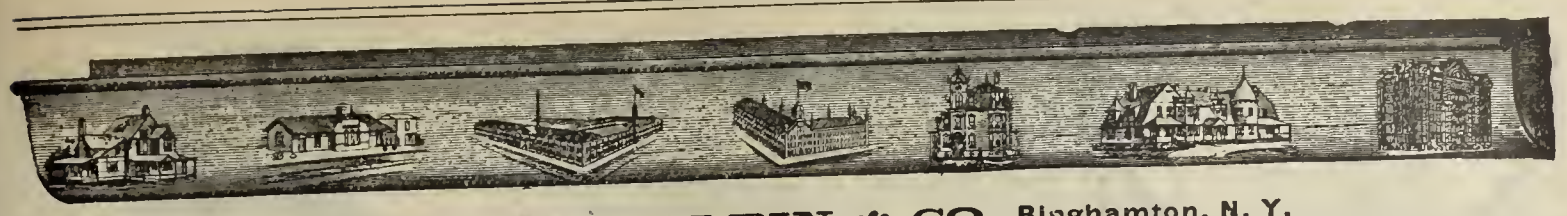
The Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

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Pat. May 19, '85. Pat. May 26, '85. Pat. July 14, '85. Pat. Aug. 8, '88. Pat. Nov. 23, '86.



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USE VANDERMAN'S SPECIAL TOOLS.

No Plumber or Steam-Fitter can Afford to be Without Them.

THE VANDERMAN PIPE VISES CANNOT BE EQUALED.

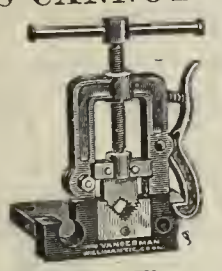


Lead Pipe Cutter.

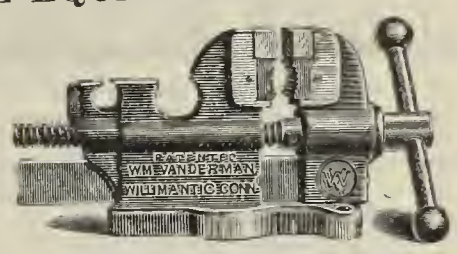


Joint Runner (applied).

Lead Pipe Bender.



Hinged Pipe Vise.

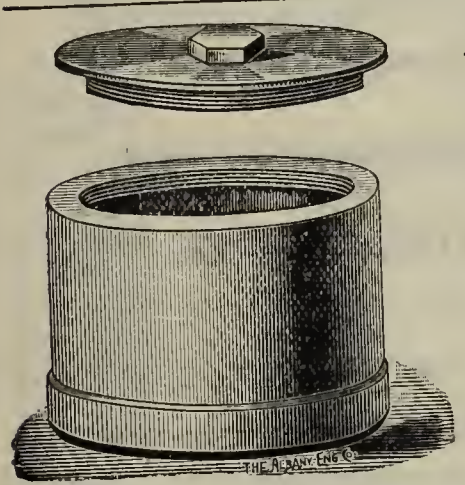


Comb. Bench Vise with Bending Forms.

USE VANDERMAN'S ESTIMATE AND LIST-BOOK. It prevents mistakes in making estimates.

OFFICE ESTIMATE BOOK, $1.50 each. POCKET ESTIMATE BOOK $0.40 each. Sent by Mail prepaid if cash is sent with order.

The Vanderman Plumbing & Heating Co., Willimantic, Conn.



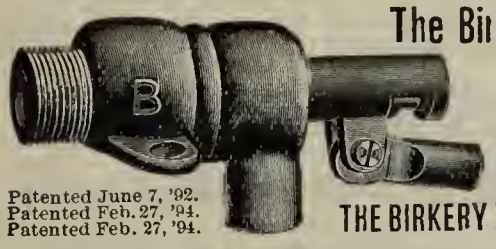
A Common Sense Trap Screw Ferrule.

The body is of cast iron in regular pipe sizes, fitting the Hub neatly and making a good wall to calk against. The **COVER** being of **BRASS** cannot unite with the iron and corrosion is prevented by the use of Graphite. A Common Sense Article at half the cost of brass.

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69 Perry St., ALBANY, N. Y.

FOR SALE BY ALL DEALERS.



The Birkery High Pressure Ball Cock

Is the Best, Cheapest and most Perfect Working Ball Cock ever offered to the public.

It will not Sing or Hammer.

For sale by dealers in Plumbers' Supplies.

Patented June 7, '92.
Patented Feb. 27, '94.
Patented Feb. 27, '94.

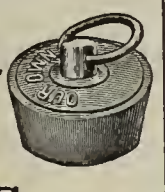
THE BIRKERY MFG. CO., Sole Manufacturers, HARTFORD, CONN.



"OUR OWN" BASIN PLUGS

With Nickel Trimmings are the Neatest and Best.

SAMPLE DOZEN ASSORTED $1.



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MANUFACTURER OF

MOULDED RUBBER GOODS,

BRIDGEPORT, CONN.

TINNERS AND ROOFERS,

THIS IS THE APPARATUS



AND THIS IS WHAT WE SAY:

If Our Burgess Gem No 3

cannot be worked out of doors or on roofs in all kinds of weather, bring it back and your money will be refunded.

CAN YOU ASK MORE?

All have cast iron cylindrical burners so arranged that solder cannot clog them.

Ask your Jobbers for them or Write for Prices.

Manufactured by **Burgess Soldering Furnace Co.,** COLUMBUS, OHIO.



DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.

The only Portable Folding Bathtub made; can be stored in space 2⅛ x 2⅛ x 6 feet; can be moved from bathroom to sickroom.

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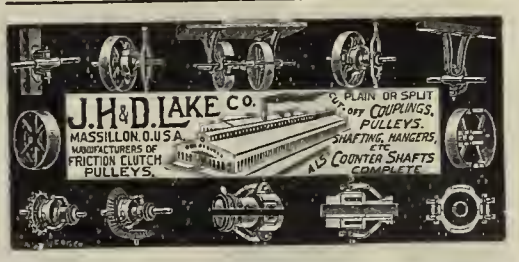
Centre St., and 681 Sixth Ave., Cor. 39th St., New York.

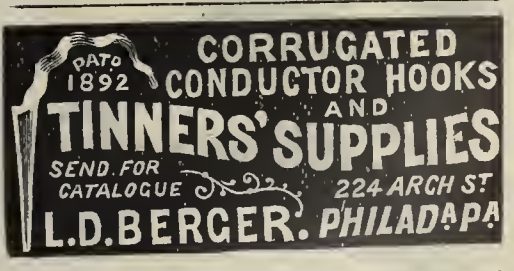
Lead Pipe, Sheet Lead, Shot,

Plumbers', Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrough Iron Pipe of all sizes cut to order





LEATHER AND RUBBER

WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

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The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating burners.** It is a modern, perfected apparatus warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adjustable burners. Send for catalogue.

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THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.

It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.



COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
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8-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

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ANGLE PLUG FAUCET

For Family Oil Cans, Etc.

(Patent applied for.)



The Faucet is constructed with a Plug set on an angle, making it very convenient, and has a double running thread. The liquid has a direct flow, which obviates oozing out through the threads; in fact, the objectionable points with other styles are overcome.

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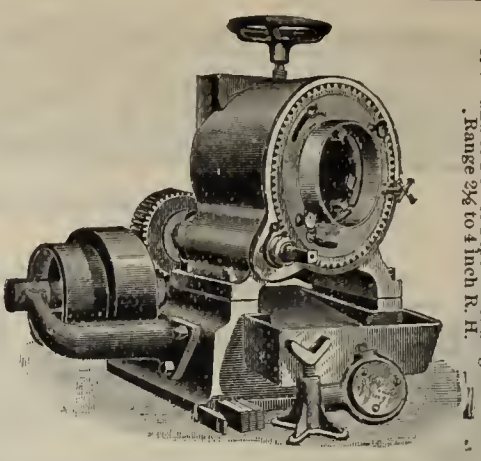
When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

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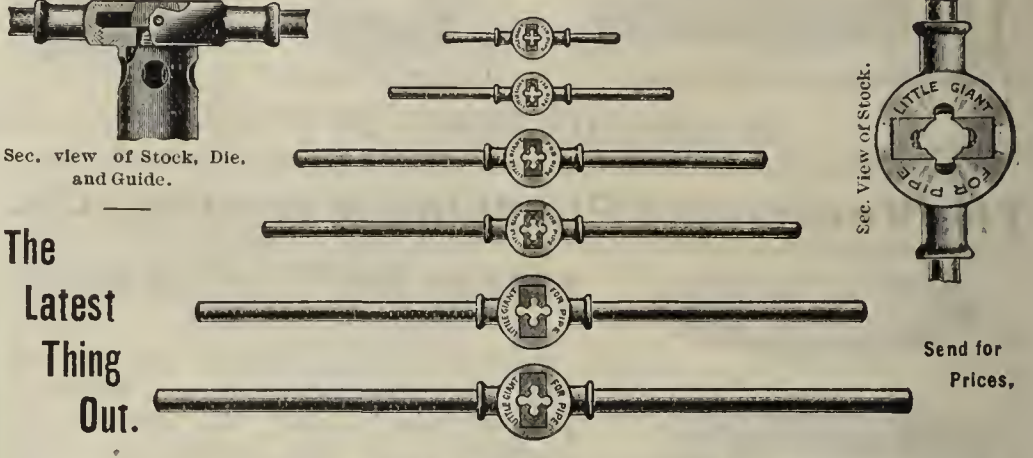


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PIPE PLATES

WITH STOCK, DIE AND GUIDE FOR EACH SIZE.

Sec. view of Stock, Die, and Guide.



Sec. View of Stock.

The Latest Thing Out.

Send for Prices,

MANUFACTURED BY **WELLS BROS. & CO.** GREENFIELD MASS.

THE STEEL CLAD BATH

is an indestructible, graceful steel shell lined with heavy tinned and planished copper. It cannot warp, rust, or collect dirt, and is an open sanitary fixture at a moderate cost. Enameling and decorations to match the bathroom.

FOR SALE BY ALL JOBBERS.

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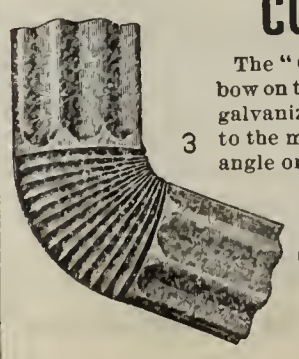
Steel Bath Mfg. Co.

Detroit, Mich.,

GEORGE BOOTH, President.

The "O. H." One Piece CONDUCTOR ELBOWS.

PLAIN, ROUND and CORRUGATED



The "O. H." is the strongest and most durable elbow on the market. Made of the best steel plate and galvanized after formation. Prompt attention given to the manufacturing of special elbows of any size, angle or material. Write for prices.

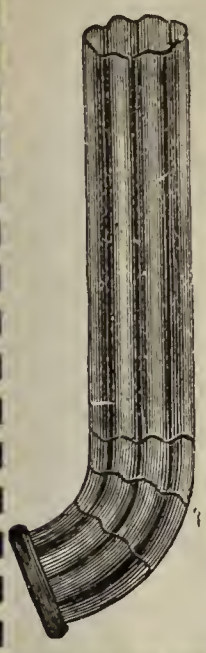
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THE LAWRENCE-LETTS ELBOW CO., Ltd.,

MANUFACTURERS,

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POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



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Manufacturers

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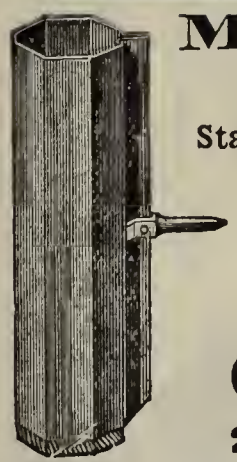
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CORRESPONDENCE SOLICITED and LOWEST PRICES GUARANTEED.









MARLIN & CO.,

(INCORPORATED.)

Manufacturers of the

Standard Expanding Water Conductors,

EAVE TROUGHS

With Detachable Couplings.

METALLIC SKYLIGHTS

—AND—

GALVANIZED IRON CORNICES.

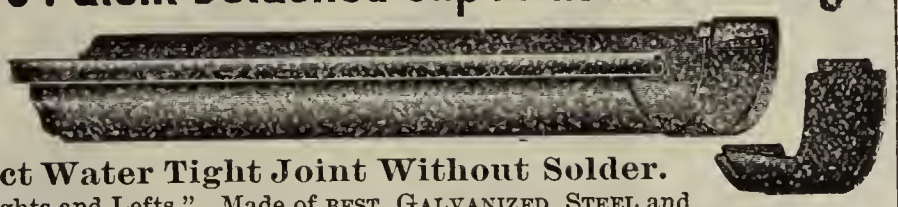
206 Robinson St., ALLEGHENY, PA.





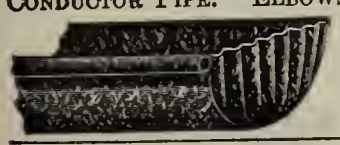
Holton's Patent Detached Slip Joint Eave Trough.

10 FEET LONG.



A Perfect Water Tight Joint Without Solder.

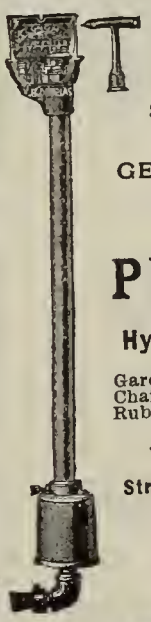
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Branch Warehouses:

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GEORGE W. ROBERTSON,

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Manufacturers of

PUMPS,

Hydraulic Rams,

Garden Engines, Pump Chain and fixtures for Rubber Bucket Pumps,

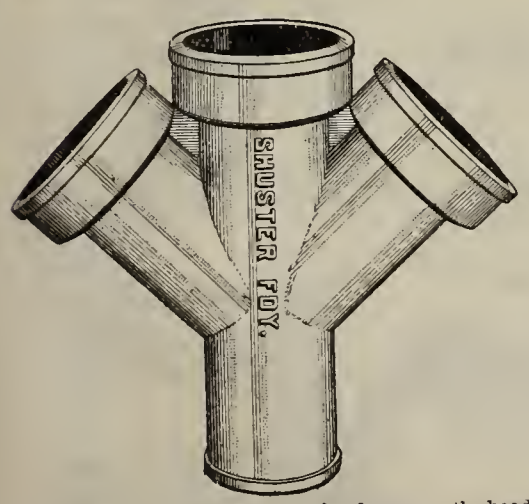
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Works founded in 1832. Highest medals awarded at all the World's Exhibitions. Send for catalogues and prices.

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Common Fittings.

DOUBLE Y.

Sizes:

6 x 6 to 6 x 2 inclusive.
5 x 5 to 5 x 2 "
4 x 4 to 4 x 2 "
3 x 3 to 3 x 2 "
and 2 x 2.

Standard, medium and extra heavy weights.

Price-List on Application.

All common fittings are 2 inches longer on the bead end than those in general use, allowing plenty of room for caulking joints.

The Shuster Foundry

Manufacturers of First Quality Tested and Guaranteed Soil Pipe and Improved Fittings.

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TRADE MARK. A complete outfit. Easy to put up, always reliable and fully warranted to meet the wants of any farmer.



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Simple, durable, powerful, easy to operate never affected by frost. Patent GLASS VALVE, will never corrode. Ask your dealer for our goods. Write for catalogue.

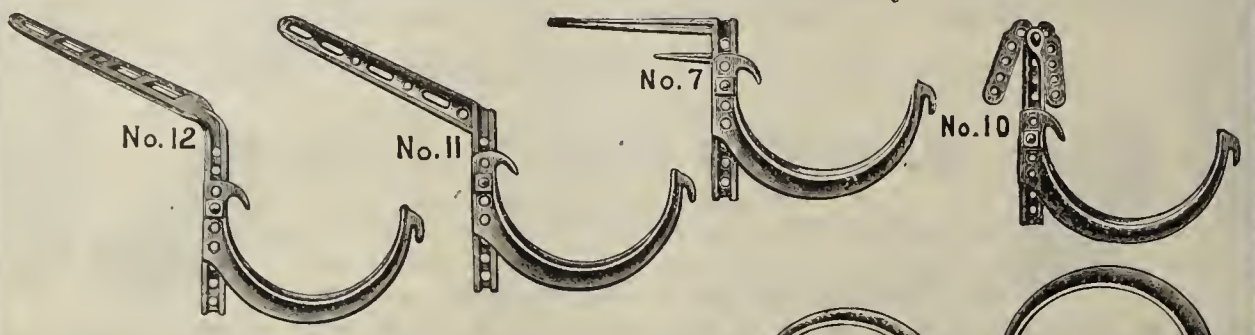
F. E. MYERS & BRO. ASHLAND, O.

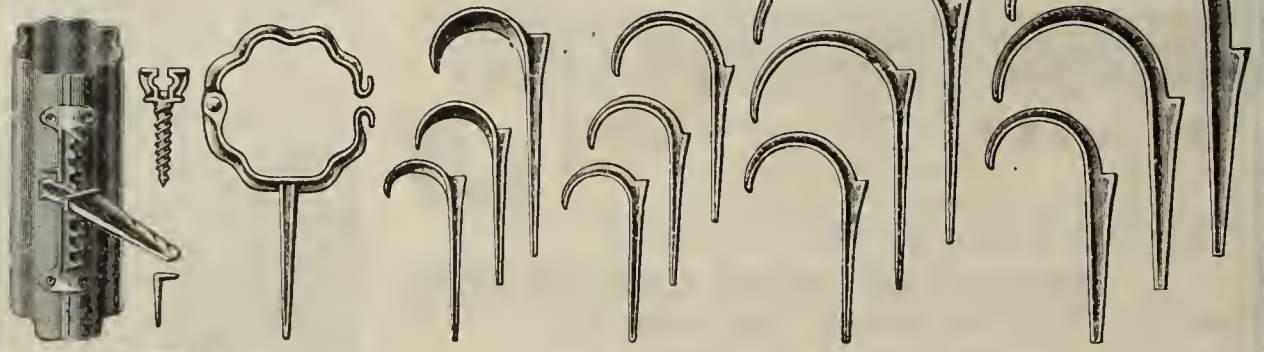


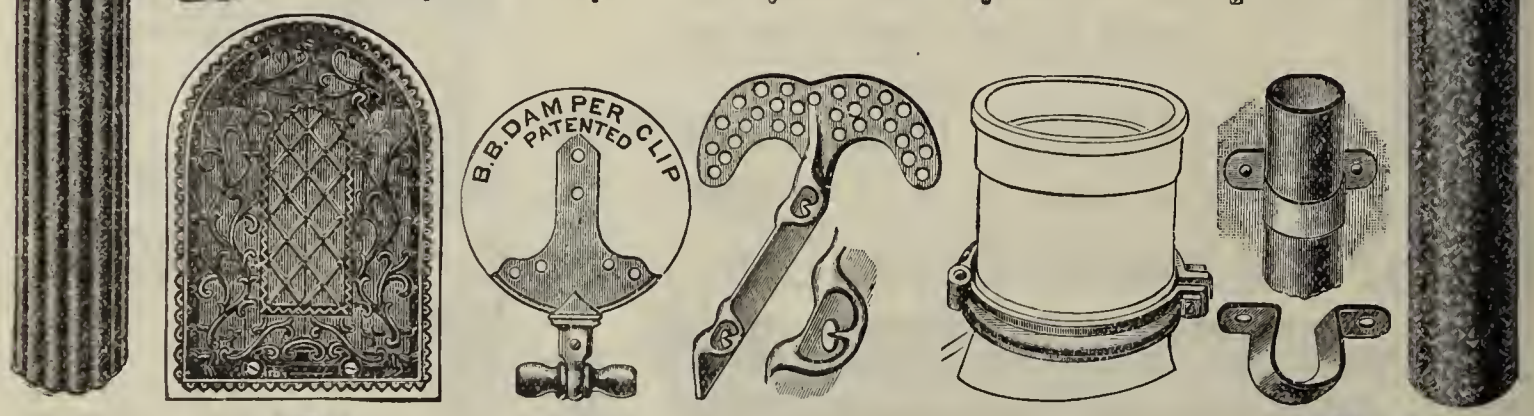
Tinners' Hardware. {BERGER BROS.} Roofers' Supplies

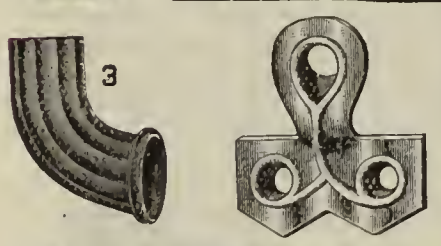
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Sole Manufacturers of the Berger Hangers and Fasteners. The most complete Tinners' Supply House in the country.

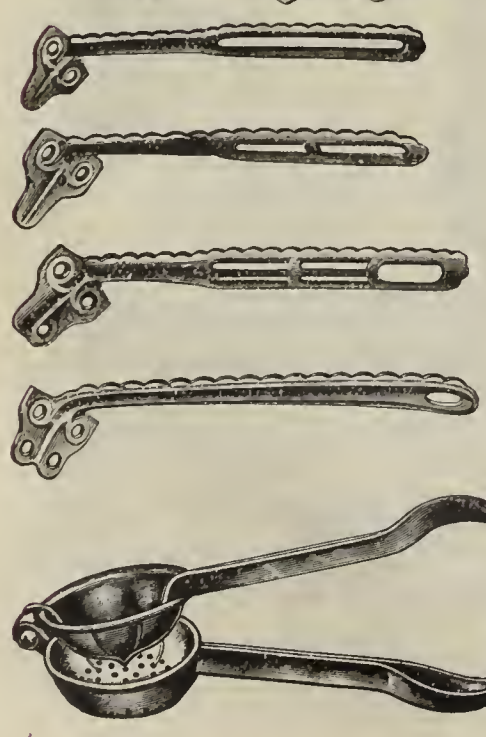






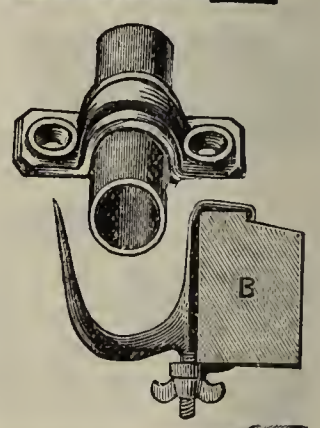






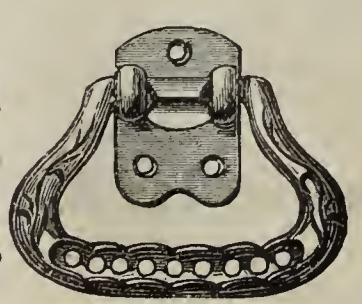
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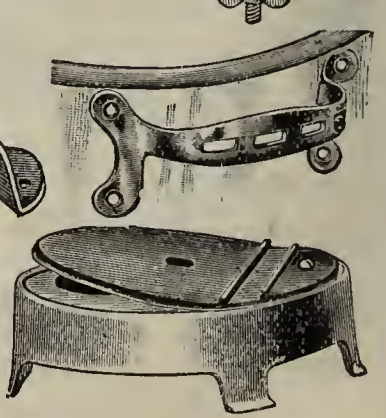


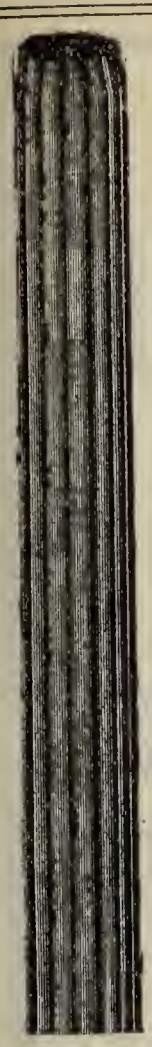
Berger Bros.,

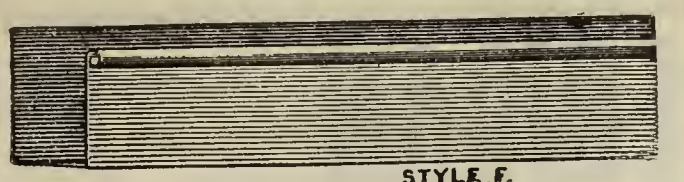
237 ARCH STREET, PHILADELPHIA.











STYLE F.

Clark, Quien & Morse,

W STREET, PEORIA, ILLINOIS.

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PLECKER'S

Corrugated Conductor,
Galvanized Eave-Trough,
Wire Eave-Trough Hangers.

We make the best goods in the world and our prices are reasonable.

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EAVE TROUGH CONDUCTOR Pipe.

THE KANNEBERG ROOFING CO.,
CANTON, OHIO, U. S. A.

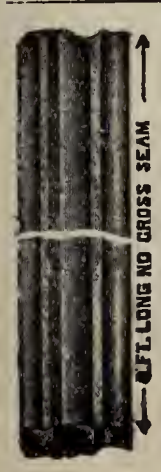
MANUFACTURERS OF

Patent Eave Trough and Hangers,
Conductor Pipe,
O. G. and Box Gutters,
Ridge Roll and Capping,
Ventilators,
Finials,
Cresting.

Patent Steel Roofing,*
Metallic Shingles,
Crimped, Beaded and Corrugated Iron,
Iron Weather-Boarding,
Sheet Steel Pressed Brick,
Mixed Roof Paint,
Building Paper, etc.†

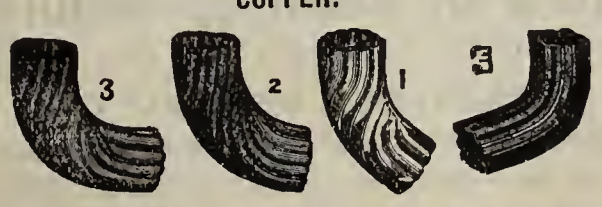
* Write for sample.

† Get Illustrated Catalog.

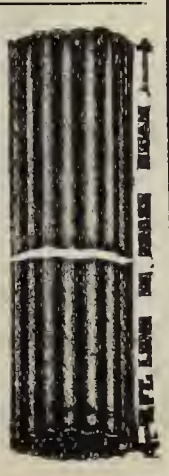


Corrugated Expanding Conductor

OF GALVANIZED IRON AND COLD ROLLED COPPER.



JAMES A. MILLER & BRO.,
129 and 131 South Clinton St.,
CHICAGO.



RITCHIE'S PATENT

IMPROVED CORRUGATED

Expanding Conductor,

ALSO

Stamped Corrugated Elbows & Shoes.



No. 3 SHOE.

In these goods the trade find for the first time satisfactory expanding Elbows and Shoes perfect in curve and free from unreliable and unsightly soldered joints.

For Sale by all Jobbers of Tinners' Supplies

LAMB & RITCHIE,

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MANUFACTURERS ALSO OF

Ritchie's Spiral Pipe. Standard Speaking Tubes

THE IRWIN & REBER

PATENT

EXPANDING WATER CONDUCTOR

MANUFACTURED BY THE

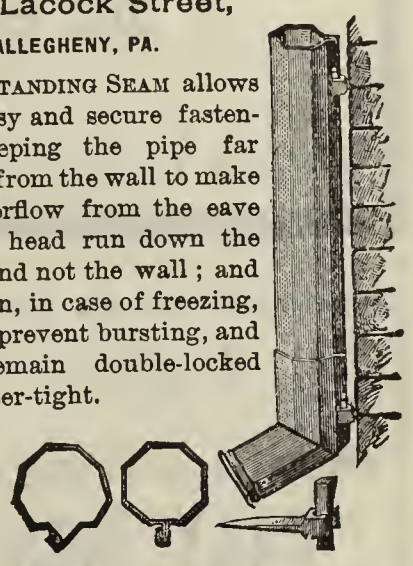
S. S. S. CONDUCTOR CO.,

LIMITED,

163 Lacock Street,

ALLEGHENY, PA.

THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

Galvanized, Kalamelned or Leaded.

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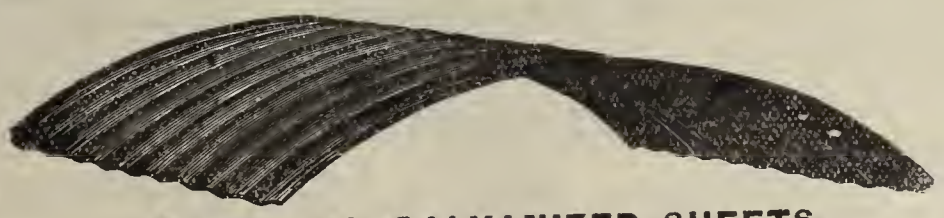
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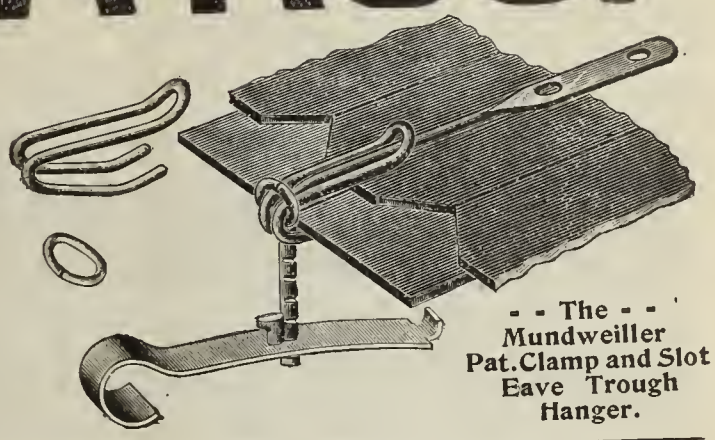
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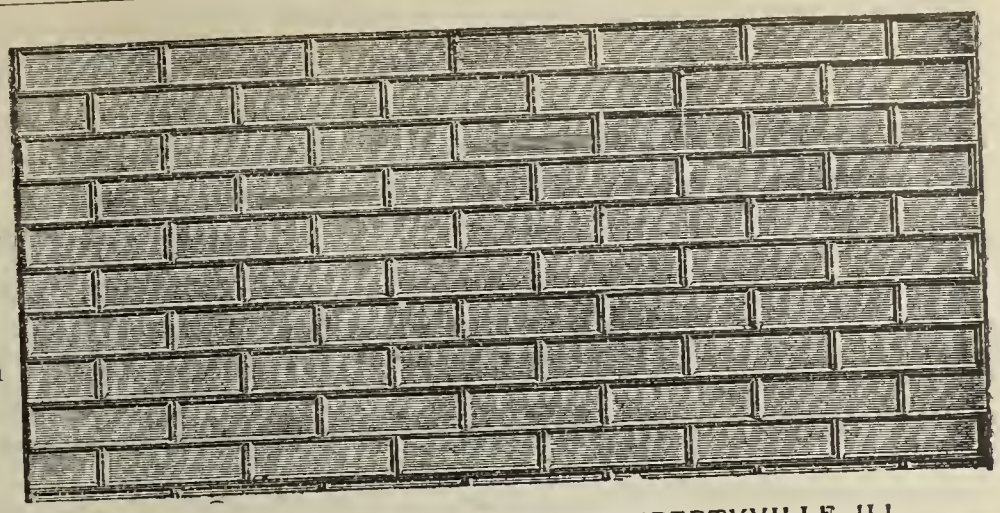
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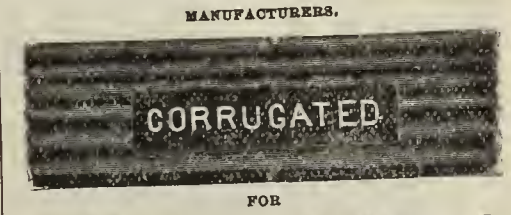
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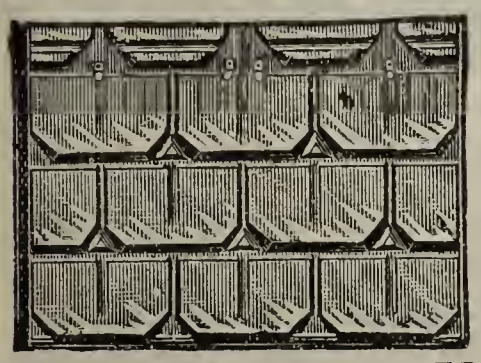
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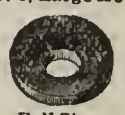
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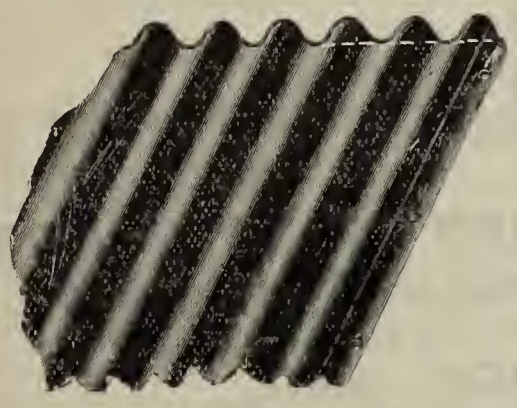
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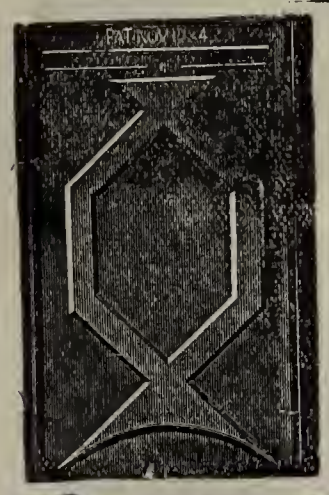
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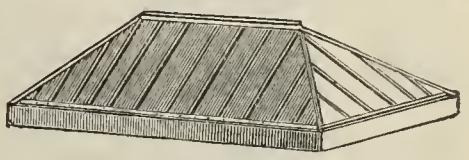
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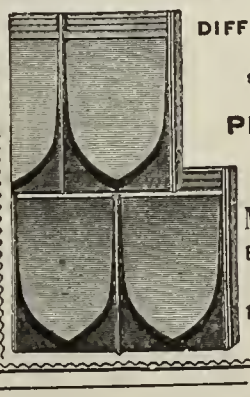
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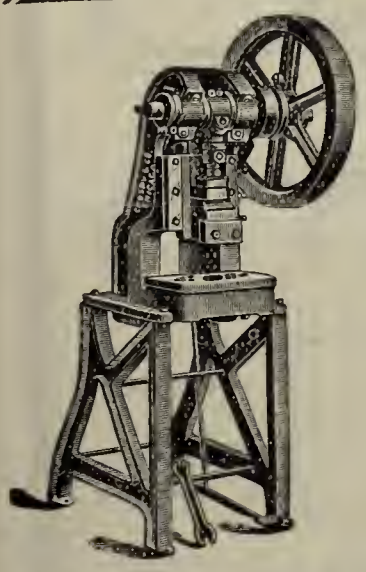
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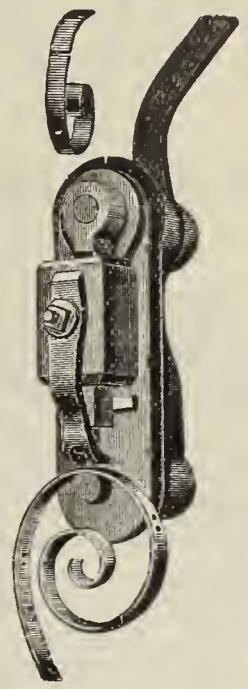
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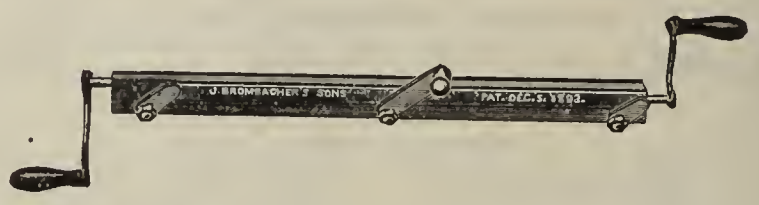
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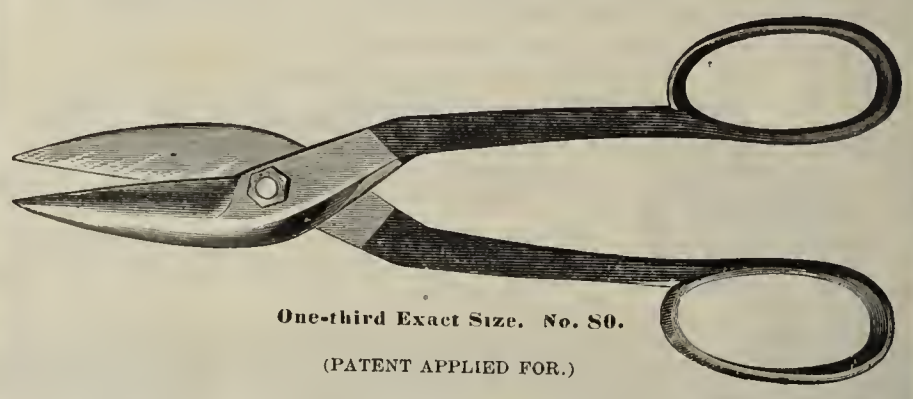
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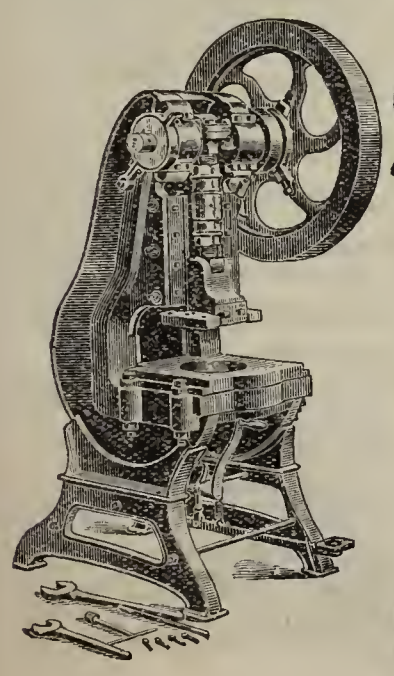


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S. S. S. Conductor Co., Allegheny, Pa.

Cookers.
Hartford Hollow Ware Co., Hartford Conn.

Copper, Roofing and Cornice.
Gummey, Spering & Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.

Cornice Machinery.
Bliss, E. W. Co., Brooklyn, N. Y,
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Keene, Geo. C. & Co., Cincinnati, O.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.

Cornice Work, Galvanized Iron.
Allen's Cornice & Corrugating Works, Chicago, Ill.
Surton, W. J. & Co., Detroit, Mich.
Marlin & Co., Allegheny City, Pa.
Miller, Jas. A. & Bro. Chicago, Ill

Couplers.
Star Coupler Co., St. Louis, Mo.

Cut-Offs, Rain-Water.
Berger Mfg. Co., Canton, Ohio.
Cooney, Seiner & Co. Indianapolis, Ind.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Howell, G. W., Covington, Ky.

Dampers.
Berger Bros., Philadelphia, Pa.
Greene, W. F., Troy, N. Y.
Hodge Bros., Boston, Mass.

Die Forgings and Castings.
E. W. Bliss Co., Brooklyn, N. Y.

Die Stocks.
Curtis & Curtis, Bridgeport, Ct.
Hart Mfg. Co., Cleveland, O.

Drop Forgings.
Miner & Peck Mfg. Co., New Haven, Ct

Eave Troughs.
Berger, L. D., Philadelphia, Pa.
Berger Mfg. Co., Canton, O.
Bowers, Galpin & Co., Binghamton, N. Y.
Cantou Steel Roofing Co.
Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co, Canton, Ohio.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O
Rhodes, Dickelman & Co., Forest, O.

Eave Trough Hangers.
Bell, John W. & Co., Mercer, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill
Rhodes, Dickelman & Co., Forest, O.
Walther & Christman, Cleveland, O.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Elevators.
Morse, Williams & Co., Philadelphia, Pa

Enameled Ware.
Iron Clad Mfg. Co., 22-24 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Flour Sifters.
Climax Mfg. Co., Cleveland, Ohio.
Meyers, Fred J. Mfg. Co., Covington, Ky.

Flue Stops.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Foundry Facings, Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago.
Safety Furnace Pipe Co., Detroit, Mich.
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bennett & Peck Heating & Ventilating Co., Cincinnati, O.
Bibb, B. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Craig-Reynold Foundry Co, Dayton Ohio.
Fox Furnace Co., Cleveland, Ohio.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess, Snyder & Co., Massillon, Ohio.
Howard Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J F, Furnace Co., Syracuse, N.Y.
Ridgway Furnace Co., Boston, Mass.
Schill Bros., Crestline, Ohio.
Sheppard, Isaac A. & Co., Phila., Pa.
Simonds Mfg. Co., 50 Cliff St., N. Y.
Stamford Foundry Co., Stamford, Conn.
Superior Furnace Co., Little Falls, N. Y.
Weiskittel, A. & Son, Baltimore, Md.

Furnaces, Plumbers' and Tinners'.
Burgess Solderiug Furuace Co., Columbus, Ohio.

Gas Heaters—*See Stoves and Ranges Gas.*

Gas Machines.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Grain Measures.
Belmire Stamping Co., Harvey, Ill.

Grate Guard.
Dow Wire Works Co., Louisville, Ky.

Grates.
Jackson, W., Sons, 246 Front St., N. Y.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Handles and Knobs.
Specialty Wood Working Co., Warren, Ohio.

Hardware Specialties.
Philadelphia Hardware & Malleable Iron Works, Philadelphia, Pa.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heaters, Steam and Hot-Water.
Barstow Stove Co., Providence, R. I.
Bell, Geo. H. & Co., 114-116 Nassau St., New York.
Broomwell, Schmidt & Co., Ltd., York, Pa.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Fuller & Warren Co., Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Hot Water Heater Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
McLain, J. H. Co., Canton, O.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N. Y.
Putnam Foundry & Machine Co., Putnam Conn.
Raymond & Campbell Mfg. Co., Middletown, Pa.
Scollay, Jno. A., Brooklyn, N. Y.
Smith Co., H. B. 137 Centre St., N. Y.
Springfield Coil Boiler Co., Springfield, Mass.
Weathered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Brouson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
Iron Clad Mfg. Co., 22-24 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Stuart & Peterson Co., Philadelphia, Pa.

Ice Cream Cans.
Stuart & Peterson Co., Philadelphia, Pa.

Ice Cream Measures.
Clad, Valentine & Sons, Phila., Pa.

Iron, Galvanized Sheet.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Cort, M. H., 9 Burling Slip, N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry & Clark, 535-547 West 15th St., New York.
Moorhead-McCleane Co., Pittsburgh, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphi Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Moorhead-McCleane Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co, St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
U. S. Iron & Tin Plate Mfg. Co., Demmler, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

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Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Iron & Wire Work, Ornamental.
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Coldwater Oil Stove Co., Coldwater, Mich.
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Rochester Lamp Co., 42 Park Place, N. Y.

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Colwell Lead Co., 63 Centre St., N. Y.

Linenoid.
Crane Bros., Westfield, Mass.

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Penn Iron Roofing and Corrugatiug Co., Ltd., Philadelphia, Pa.

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Sanborn, J., 217 Water St., N. Y.

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Belden, F. E. Mica Mining Co., Boston, Mass.
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Palermo Mica Co., 27 Peck Slip, N. Y.
Schoonmaker, A. O., 158 William St., New York.

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Mica Mfg. Co., 89 Fulton St., N. Y.

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N. Y. Nickel Plating and Mfg. Co., 227 and 229 West 29th St., N. Y.

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Potato Masher.
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Miner & Peck Mfg. Co., New Haven, Conn.
Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co., Toledo, O..

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Lake, J. H. & D. Co., Massillon, O.

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Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

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Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 41 John St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.
Rothweiler, W. J., Pittsburgh, Pa.

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Allen's Cornice & Corrugating Works, Chicago, Ill.
American Roofing Co., Cincinnati, O.
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Cincinnati Corrugating Co., Piqua, O.
Columbia Corrugating Mfg. Co., Niles, O
Columbia Roofiug Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, Ohio.
Globe Iron Roofiug & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Haldeman, N. A. & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
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Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugatiug Co., St. Louis Mo.
Souther, E. E. Irou Co., St, Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

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Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
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Johnson, E. J. & Co., 38 Park Row N.
Rising & Nelson, West Pawlet, Vt.

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Sheet Metal Machinery.
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Brombacher's Sons, Jacob, 30 Cliff N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.

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Indianapolis Elbow Co., Indianapolis, Ind.
Keene, Geo. C. & Co., Cincinnati, O.
Michigan Stove Co., Chicago, Ill.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stark Machine & Tool Co., Buffalo N. Y.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co. Toledo. O.

Shingles and Tiles, Metallic.

Berger Mfg. Co., Canton, O.
Bischoff, F. F. & Co., Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugatlug Co., Phila., Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Skylights.

Miller, J. A., & Bro., Chicago, Ill.

Slater's Tools.

Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y,
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N. Y
Gummey, Spering & Co., Philadelphia, Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N & G. Co., Philadelphia, P

Soldering Irons.

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Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St., N. Y.

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Knox & Stonler Arch. Sheet Metal Ornament Co., Tonlon, Ill.
Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.

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Nason Mfg. Co., 71 Beekman St., N. Y.
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Stove Patterns.

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Calely, Edw. L., Philadelphia, Pa.
Cincinnati Pattern Wks., Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Goblelle Pattern Co., Cleveland, O.
Goblelle, W. M., Cleveland, Ohio.
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Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Ruth, Patterson & Ruth, Alliance, O.

Stove Pipe Thimbles.

Bretch, A., Dayton, O.
Cheney, S. & Son., Manlius, N. Y.
Stearns, E. C. & Co., Syracuse, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
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Stove Trimmings, &c.

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Graff & Co., 208 Water St., N. Y.
Michigan Stove Co., Chicago, Ill.
Rathbone, Sard & Co., Albany, N. Y.
Raymond & Campbell Mfg. Co., Middletown, Pa.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Stamford Foundry Co., Stamford, Conn.
Superior Furnace Co., Little Falls N. Y.
Taplin, Rice & Co., Akron, O.
Welskittel, A & Sou, Baltimore, Md.
Western Stove Mfg. Co., St. Louis, Mo.

Stoves and Ranges, Gas.

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Milwaukee Gas Stove Co., Milwaukee, Wis.
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Clark, Geo. M. & Co., Chicago, Ill
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Dangler Stove & Mfg. Co., Cleveland, O.
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Glazier Stove Co., Chelsea, Mich.
Luther & Lederhos, 30 Cliff St., N. Y. City.
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Schneider & Trenkamp Co., Cleveland, O.
Troy Oil Stove Co., Troy, N. Y.

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Tinplate Decorating Co., 110 John St., N. Y.

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Cort, M. H., 9 Burling Slip, N. Y.
Dunlap, John Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
McClure & Co., Pittsburgh, Pa.
McKinley Tin Plate Co., Wilkinsburg, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry & Clark, 535 to 547 W. 15th St. N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Moorhead-McCleane Co., Pittsburgh, Pa.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Taylor, N. & G. Co., Philadelphia, Pa.
U. S. Iron & Tin Plate Mfg. Co., Demmler, Pa.
Wheeler, E. S & Co., New Haven, Ct.

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Kieckhefer Bros. & Co., Milwaukee, Wis.

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Curtis & Curtis, Bridgeport, Conn
Pancoast, Henry B. & Co., Philadelphia, Pa.
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Trimont Mfg. Co., Roxbury, Mass.
Wells Bros. & Co., Greenfield, Mass.

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Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St. N. Y.
Bruce & Cook, 186 to 190 Water St., N. Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo
Ohl, George A. & Co., Newark, N. J.
Ridgway & Wilkinson, Boston, Mass.
Rothweiler, W. J., Pittsburgh, Pa.
Ruth, Patterson & Ruth, Alliance, O.
Stark Machine & Tool Co., Buffalo, N. Y.
Stiles & Parker Press Co., Brooklyn N. Y.
Wheeler, E. S. & Co., New Haven, Ct.

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Shuster's Foundry, Philadelphia, Pa.

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Jenkins Bros., 71 John St., N. Y,
Mason Regulator Co., Boston, Mas

Ventilators and Chimney Caps

Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa

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Colwell Lead Co., 63 Centre St., N. Y,
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Kelly, Thos. & Bros., Chicago, Ill.

Water Coolers.

Central Stamping Co.

Water Heaters.

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Kearns & Rudolph Range Co., Philadelphia, Pa.
Kemp, C. M. Mfg. Co., Baltimore, Md.

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Trimont Mfg. Co., Roxbury, Mass.

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Zinc, Spelter.

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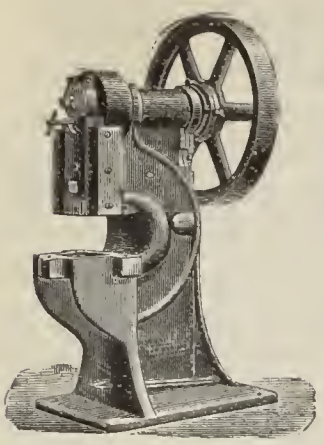
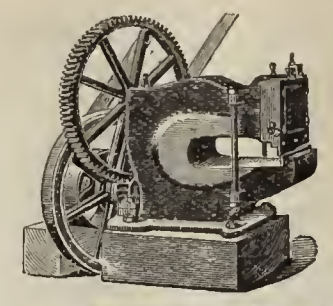
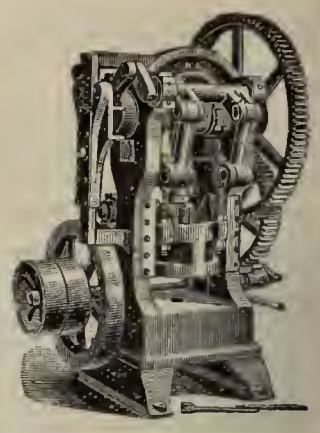
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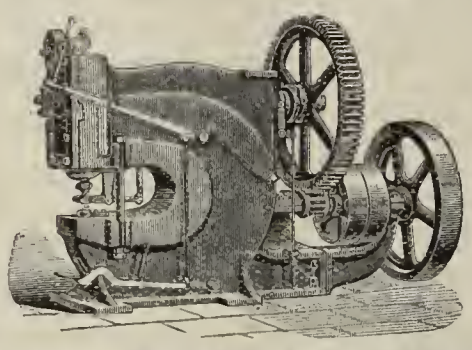
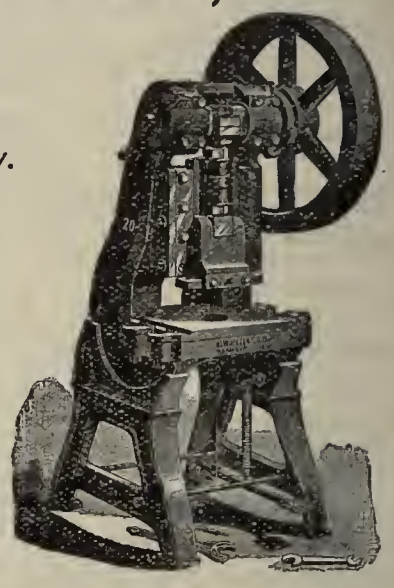




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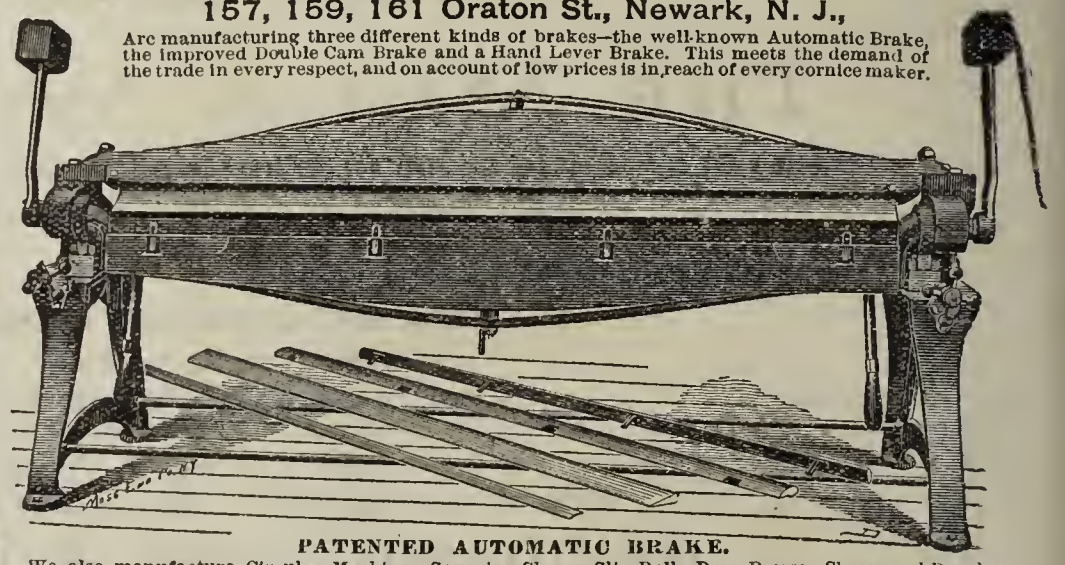
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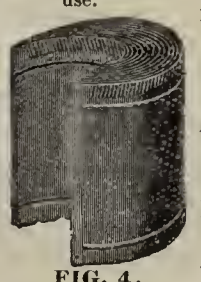
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FIG. 1


FIG. 2.

FIG. 3.


FIG. 4.

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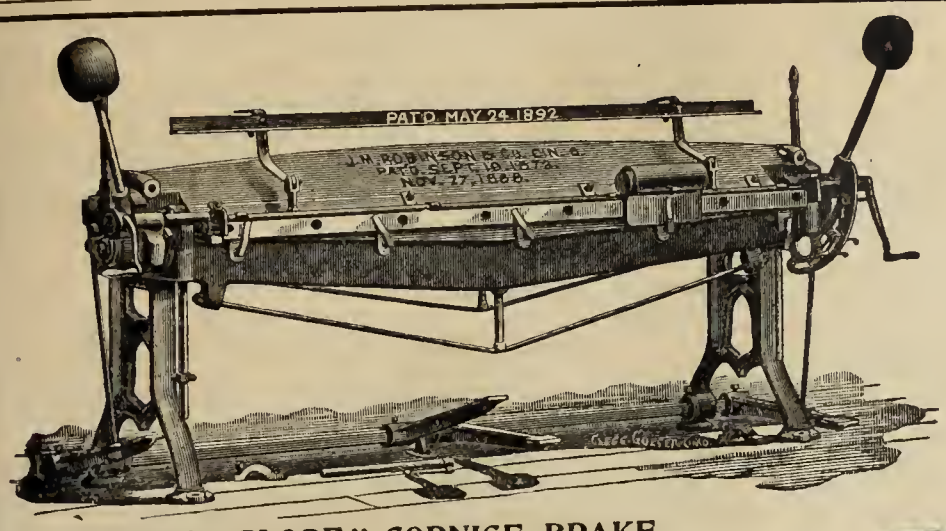
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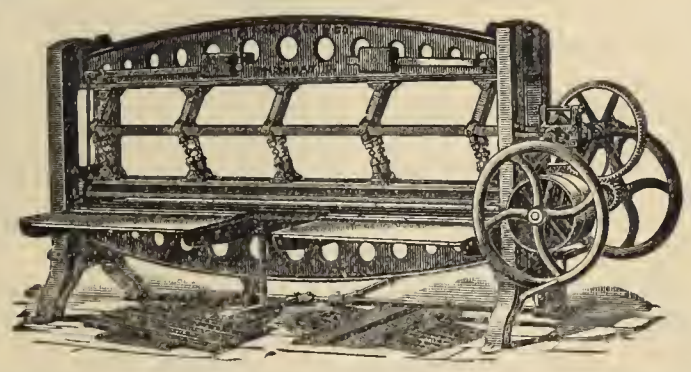


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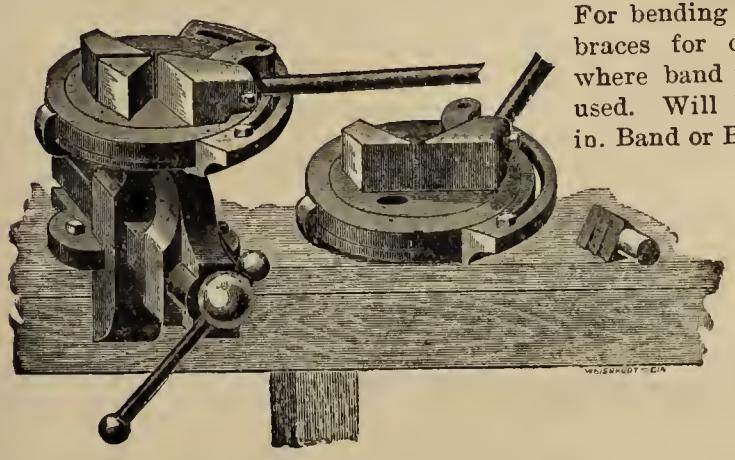
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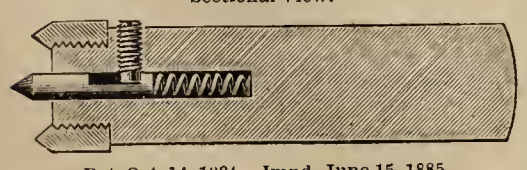
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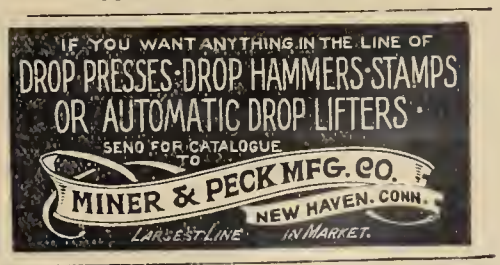
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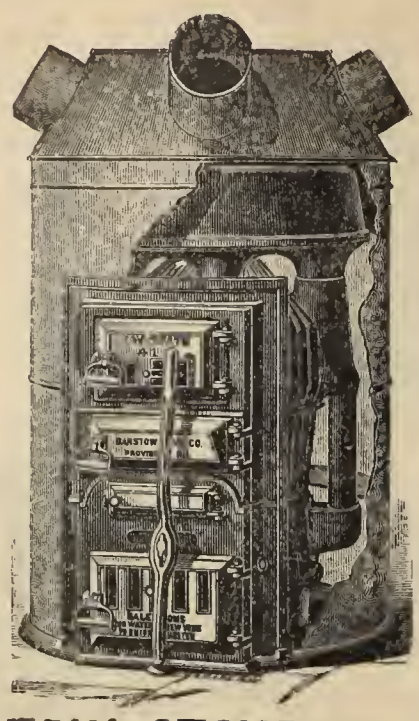
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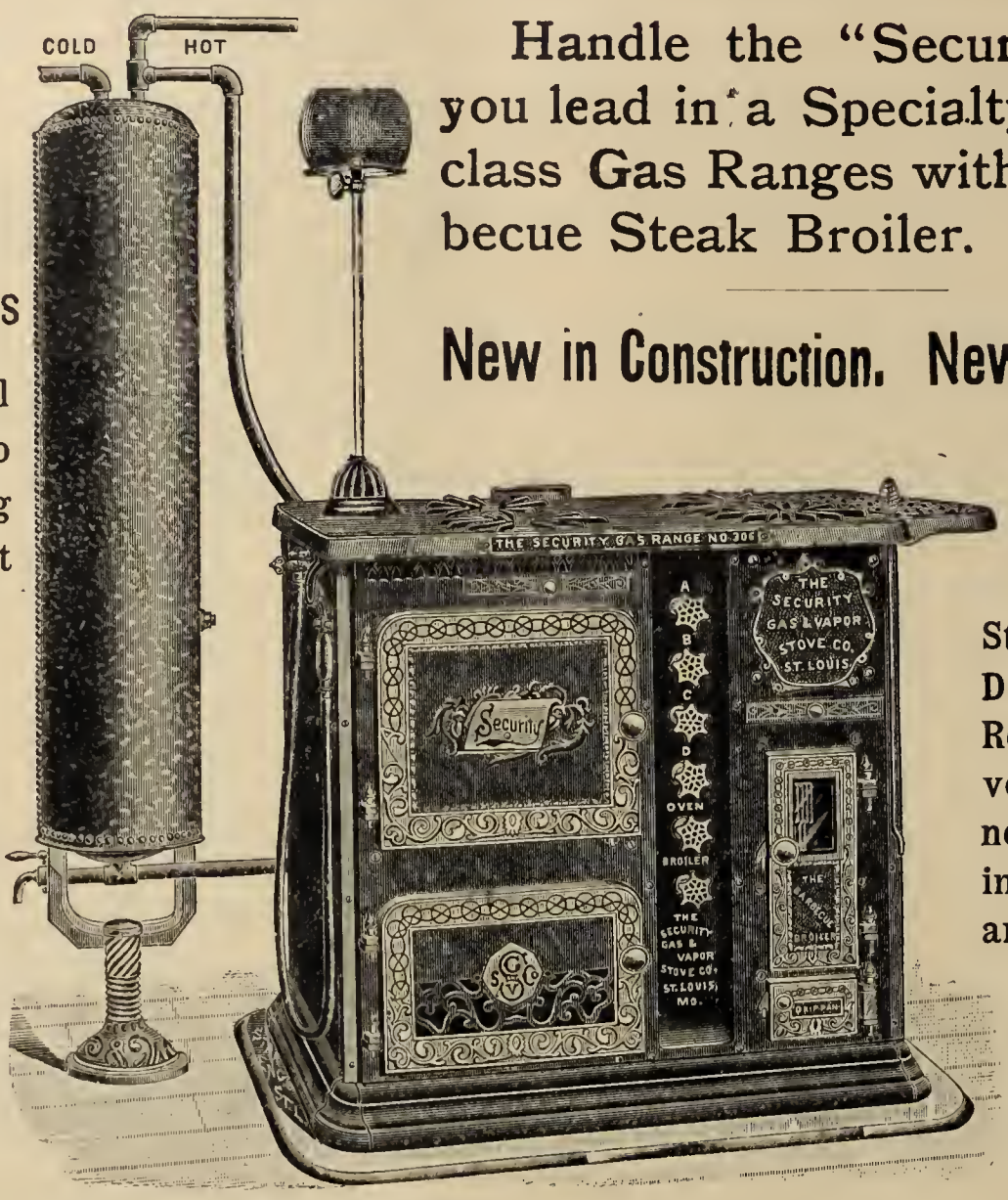
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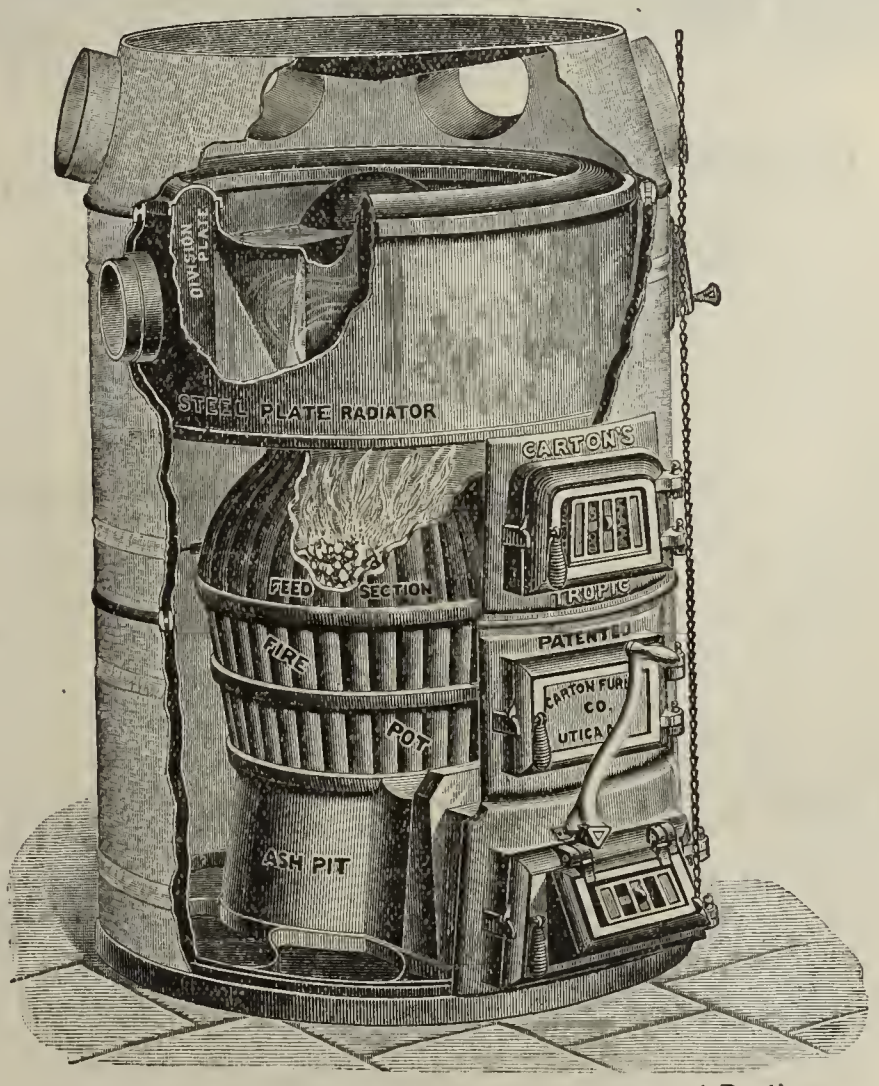
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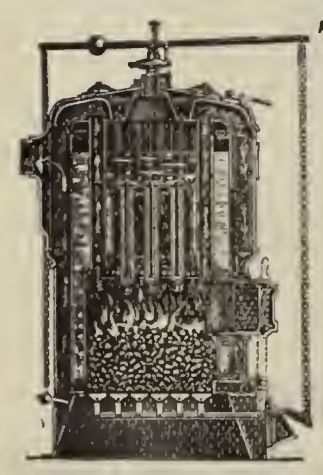
J. F. PEASE FURNACE CO.,

SYRACUSE, N. Y.

GEO. D. HOFFMAN, - 82 LAKE ST., CHICAGO.

228 Franklin Street, Boston. 1640 No. 3d St., Harrisburg.

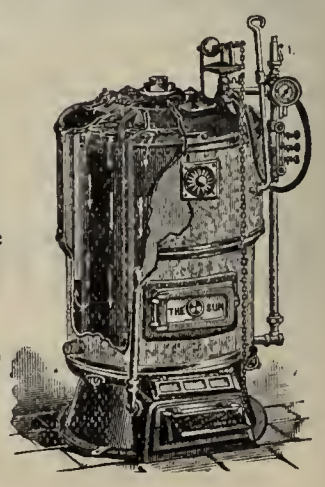
181-3-5 Queen Street, E., - - - - Toronto, Ont.



The Lindemuth Steel Sun Steam AND Hot Water Boilers

Do not need a forced argument to make the trade believe that they are the best. ∴ ∴ ∴ ∴ ∴ ∴



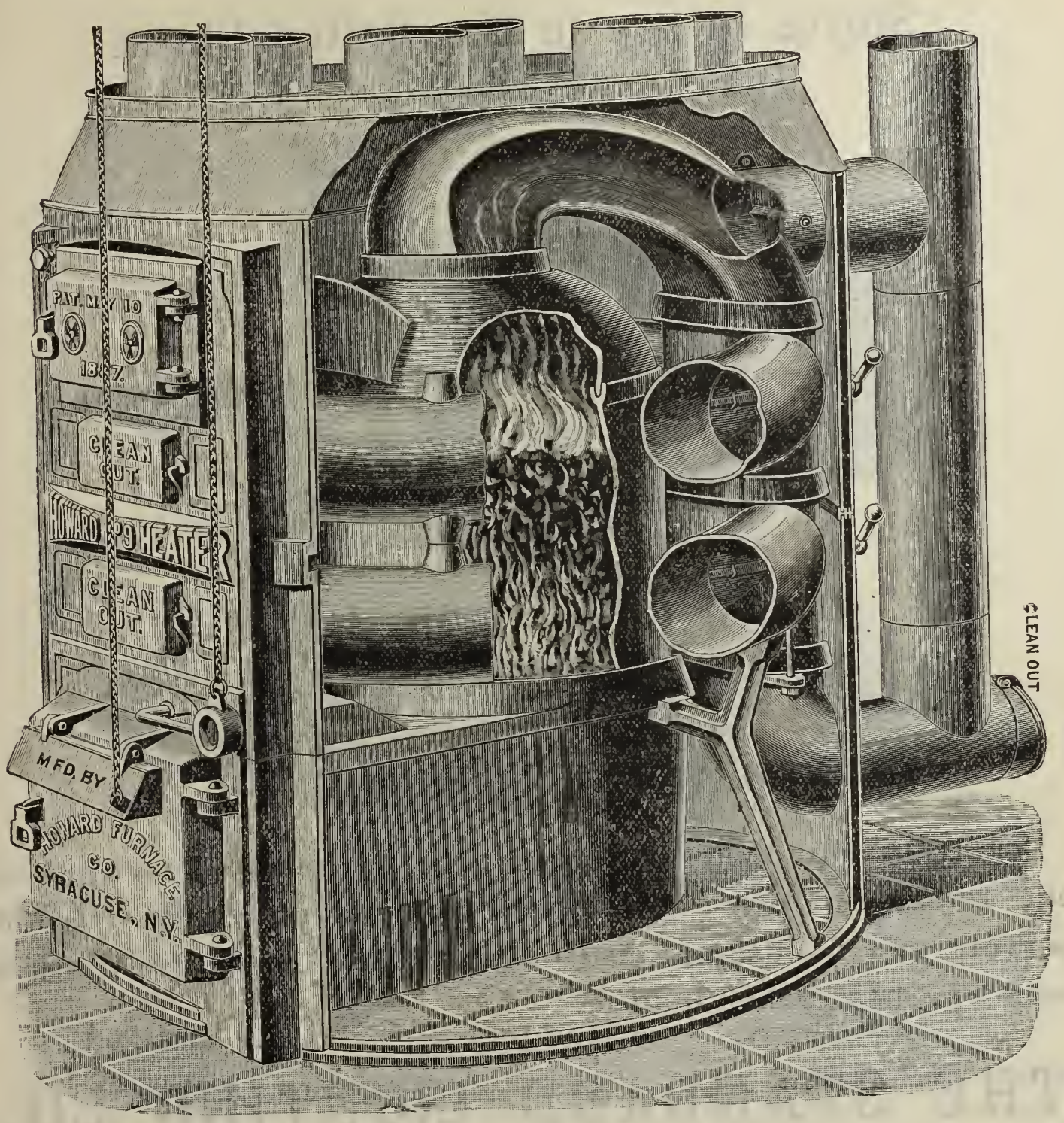


The Testimonials of their action and good results we can give you, if you but ask for them, will prove that the above is a fact. Write for prices and discounts.

MANUFACTURED BY **The Raymond & Campbell Mfg. Co.,**

Main Office and Works, Middletown, Pa.
New York Store and Warehouse, No. 244 Water St.
Boston Agency, No. 4 Oliver Street.
Philadelphia Agency, No. 45 N. Seventh.
Cleveland Agency, No. 1463 Willson Avenue.
Washington Agency, No. 1237 Ninth St., N. W.
Chicago Agency, No. 229 E. Van Buren Street.
Columbus, O., Agency, No. 106 N. High Street.

HOWARD FURNACES



Main Office and Works, Syracuse, N. Y.

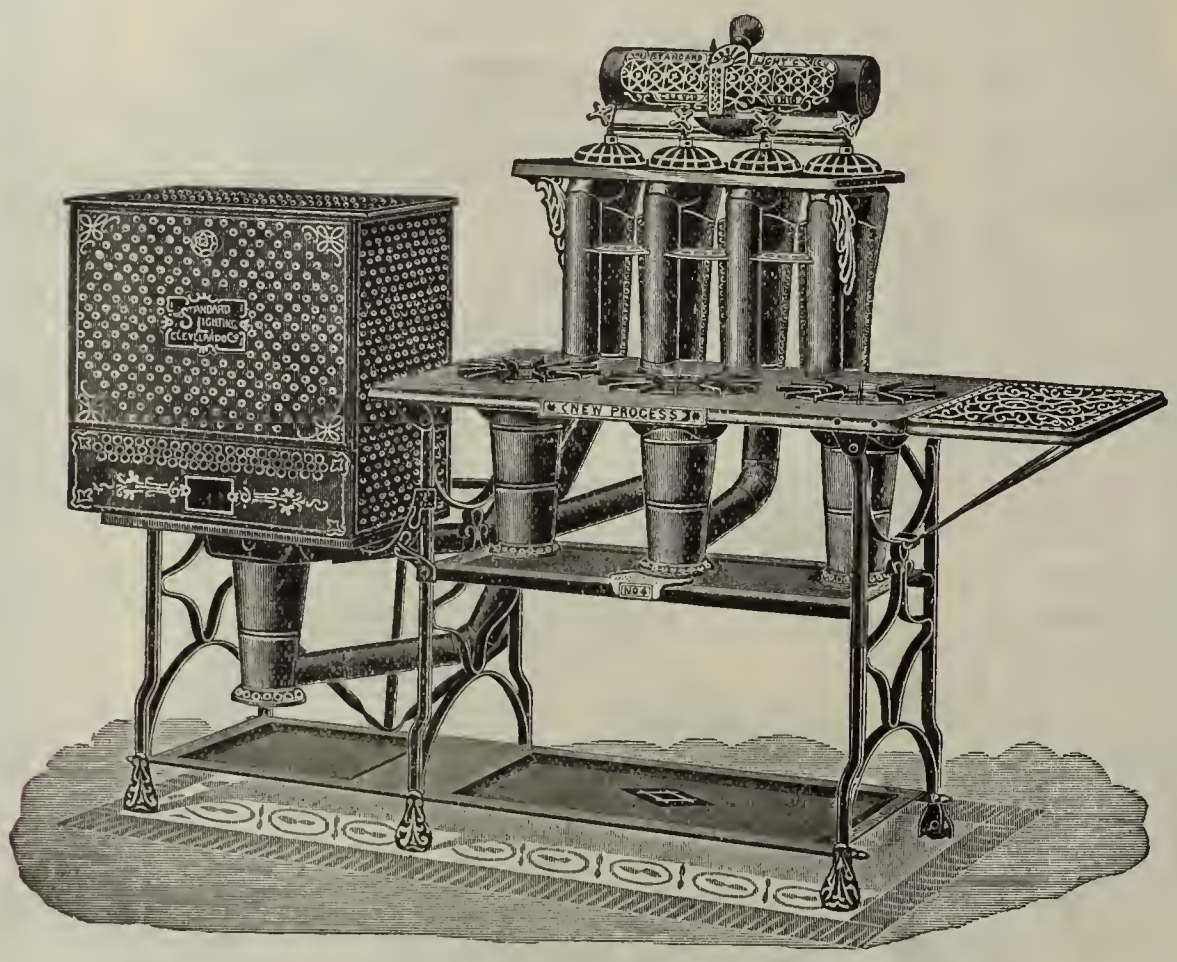
HOWARD FURNACE CO.,

New York, Boston, Grand Rapids, Toronto.

COOKING MADE EASY.

Success the Proof of Merit!

Over a Quarter Million "New Process" (evaporating) **Stoves in use in the United States.**



For 1894 equipped with brass hot air pipes, improved sight feed, removable drip valves with anti-rusting points, **cleanable reservoir** and handsome steel oven, Russia iron finish, asbestos lined. The best baker made!

THE STANDARD LIGHTING CO.,

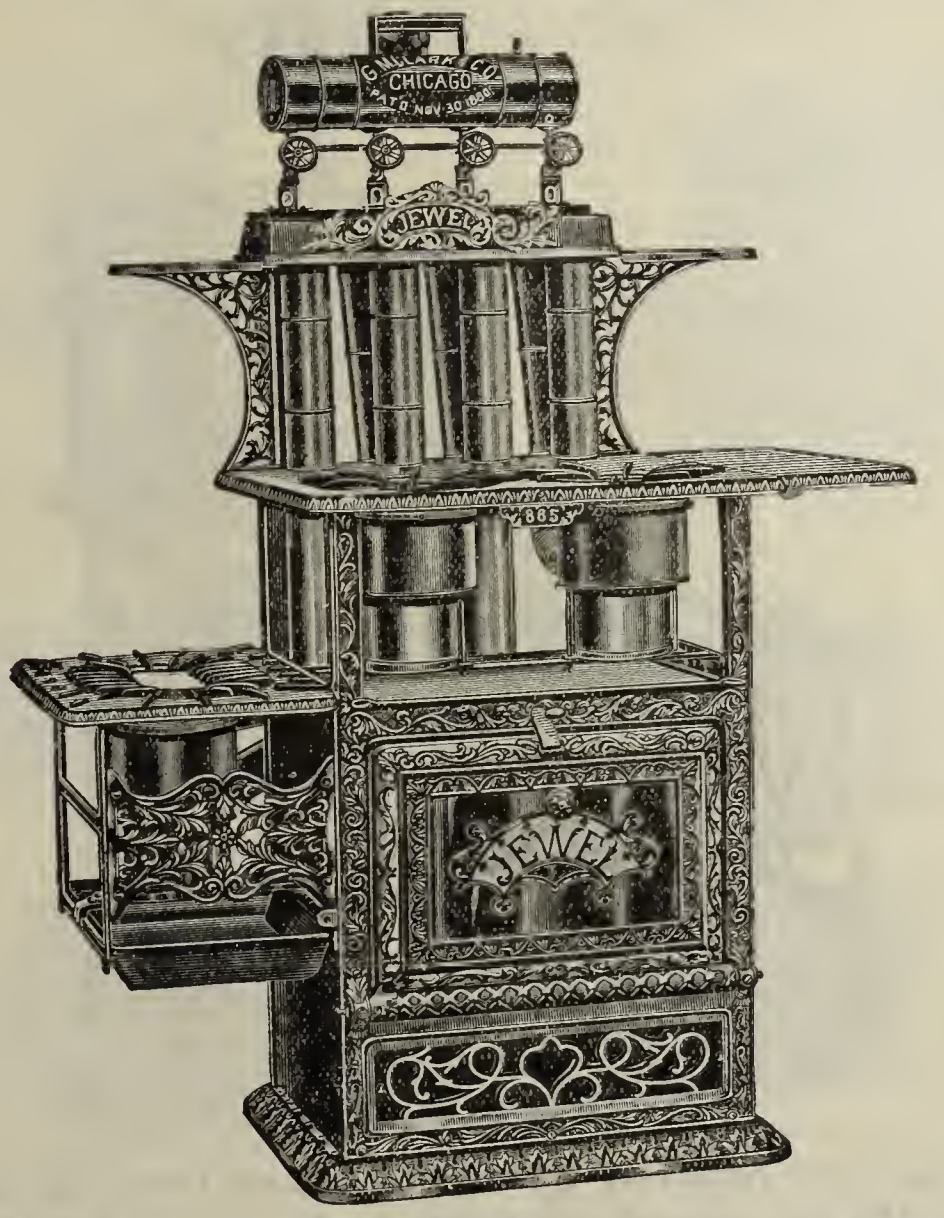
CLEVELAND, OHIO.

WHOLESALE AGENTS FOR THE SEASON OF 1894:

EUGENE MUNSELL & CO., 218 Water St., New York, N. Y.
BRADLEY, MUNK & CO., Columbus, Ohio.
BRIDGEFORD & CO., Louisville, Ky.
H. LEONARD & SONS, Grand Rapids, Mich.
TOWNLEY STOVE CO., Terre Haute, Ind.
G. A. PAULY & CO., 2703 Cass Ave., St. Louis, Mo.
KNAPP & SPALDING CO., Sioux City, Iowa
TOWNLEY METAL CO., Kansas City, Mo.
WAGNER & CHABOT, San Antonio, Texas.
F. M. BORDEN & BRO., 118 North 2d St., Philadelphia, Pa.
DODD, WERNER & CO., Cincinnati, Ohio.
MORLEY BROS., Saginaw, Mich.
T. B. RAYL & CO., Detroit, Mich.
D. S. COOK, 171 Lake St., Chicago, Ill.
NORTHWESTERN HARDWARE CO., St. Paul, Minn.
MILTON ROGERS & SONS, Omaha, Neb.
HOFFMAN & WELLER, Los Angeles, Cal
W. WETTER MFG. CO., Memphis Tenn.

JEWEL Process Stoves

ARE UNEQUALED.



Because of a record of not one imperfect or returnable stove.

Write for Catalog showing 46 Stoves.
It may save you many dollars.

George M. Clark & Company,

Makers,

149=161 Superior Street, CHICAGO.

SPECIAL AGENTS:

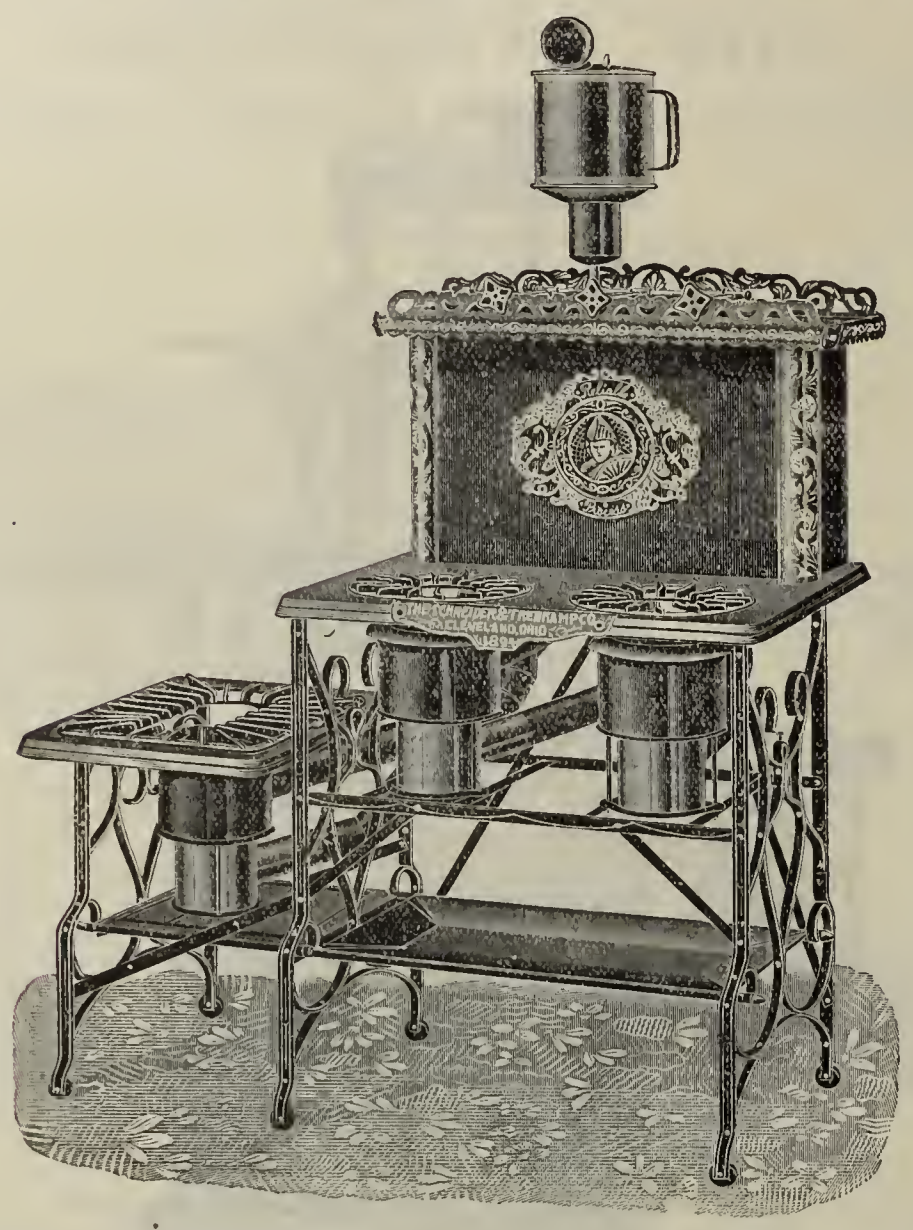
GREAT WESTERN STOVE CO., Leavenworth, Kan.
W. W. MONTAGUE & CO., San Francisco, Cal.
MARSHALL-WELLS HDW. CO., Duluth, Minn.
CHAS. NIEDRINGHAUS HOUSE FURN. CO., St. Louis, Mo.
STRATTON & TERSTEGGE, Louisville, Ky.
TETTENBORN & CO. Cincinnati, Ohio.

A. W. MARTIN, Baltimore, Md.
REEVES & HORNER, Philadelphia, Pa.
BARSTOW STOVE CO., New York, N. Y.
WALBRIDGE & CO., Buffalo, N. Y.
BOSTON FURNACE CO., Boston, Mass.
H. SANDMEYER & CO., Peoria, Ill.

RELIABLE

Gasolene Stoves.

IMPROVED FOR 1894.



If you have not received our NEW ILLUSTRATED CATALOG write for one. We make the largest, most complete line, and make and sell more Gasolene and Gas Stoves than any other concern.

76,807 COMPLETE STOVES SOLD IN 1893.

THE SCHNEIDER & TRENKAMP CO.,

CLEVELAND, OHIO.

AGENTS:

HENRY N. CLARK, Boston, Mass.—New England States.
THE KEELEY STOVE CO., Philadelphia, Pa.—State of Pennsylvania and New Jersey.
E. H. HUENEFELD, Cincinnati, O.—Southern Ohio, Southern Indiana, Southern Illinois States of Kentucky and West Virginia.
HENRY R. HAMILTON, Chicago, Ill.—Northern Illinois and Southern Wisconsin.
HUNTER & STREHLOW, Peoria, Ill.—Central Illinois.
HEYMAN & CO., Grand Rapids, Mich.—Grand Rapids.
SAGINAW HARDWARE CO., Saginaw, Mich.—Northern Michigan.
HENRY C. WEBER & CO., Detroit, Mich.—Detroit and Wayne Co.
HERBOTH MERCANTILE CO., St. Louis, Mo.—State of Missouri (excepting Kansas City) and State of Arkansas.
WM. LYLE DICKEY & CO., Omaha, Neb.—Wholesale Agents for State of Nebraska.
A. L. WEST, Des Moines, Ia.—State of Iowa.
THE A. J. HARWI HARDWARE CO., Atchison, Kas.—State of Kansas (excepting Kansas City, Kas.) and Oklahoma.
LOEWEN BROS., Kansas City, Mo.—Kansas City, Mo., Kansas City Kas., Argentine and Armourdale.
ROBERT SEEGER, St. Paul, Minn.—States of Minnesota, North and South Dakota and Montana.
THE H. HALLER MFG. CO., New Orleans, La.—States of Louisiana and Mississippi.
THE PHILLIPS & BUTTORFF MFG. CO., Nashville, Tenn.—States of Florida, Georgia, Alabama, Tennessee (excepting Knoxville and Chattanooga) and North and South Carolina.
WIESTER & CO., San Francisco, Cal.—Pacific Coast.
CHAS. F. FOX, Dayton, O.—Central and Western Ohio and Eastern Indiana.
HOWARD W. PEAR, Ft. Worth, Texas.—State Agent for Texas.

OILGAS

HAVE YOU SEEN OUR IMPROVED OILGAS BURNER FOR 1894?

THE ONLY KEROSENE VAPORIZING OIL STOVE IN THE WORLD, AND THE BEST GASOLENE STOVE EVER CONSTRUCTED.

OILGAS

Is a Gas produced by vaporizing any of the refined products of petroleum.



We make the **OILGAS STOVES** in six different styles and sizes (either in Cast Iron or Sheet Steel), including two sizes of the **OILGAS LAMP STOVE.**

AN UNQUALIFIED AND PRONOUNCED SUCCESS.

All of our Vapor Stoves are substantially constructed and highly ornamental, being finished in Japan, Nickel and Bronze.

This cut practically represents our Three Burner and Step Oilgas Cook Stove, showing the burner with a section of the outside jacket removed, presenting a view of the outside perforated burner wall, also showing Feed Pipe and hole in the burner for lighting.

We have in this burner everything that could possibly be desired in a burner.

1st. SIMPLICITY
2d. DURABILITY.
3d. Vaporizing ordinary kerosene oil in less than one minute from the time of first applying match.
4th. Producing a perfect blue vapor flame of intense power.
5th. Vaporizing gasolene in 10 seconds from the time of first applying match and producing and maintaining a purer and more powerful flame than any other gasolene vapor stove in existence.

Note only one of the many advantages that this stove has over any other vapor stove ever produced. **You can burn either kerosene or gasolene** with perfect impunity and at pleasure and **with the same satisfactory results.**

Any enterprising dealer who will push the sale of this stove **can make more money** than he has ever heretofore dreamed of making out of the sale of oil or vapor stoves.

That our Oilgas Cook Stove is a pronounced success in the hands of every intelligent user is more than ever assured by the rapid increase in our sales and the glowing testimonials that we are daily receiving from those who have used the stove during the past season.

Less than two years ago we first introduced our Oilgas Cook Stove to the public. It has grown in popular favor since the very day of its first introduction.

We are the only manufacturers in the world of an Oil Vaporizing Stove and the largest manufacturers of Oil and Gas Stoves. Over two hundred different styles and sizes for cooking and heating purposes; also miscellaneous articles, such as Nursery Burners, Glue Pot Heaters, Gas Irons for Tailors and Dress Makers, Chemical Stoves, Lanterns, Glass Oil Cans, etc., etc.

The following named **Lamp Stoves** are well and **favorably known** to the trade and public:

American, Fairy Queen, Gypsy, Sun, Champion, Florence, Iron Clad, Tom Thumb, Columbia, Globe, Monarch, Volunteer, Reliance.

For Further Information, Prices, Terms, &c., address

CENTRAL OILGAS STOVE CO.,

Boston. New York. Chicago. San Francisco.

MILWAUKEE GAS STOVE CO.,

OFFICE AND WORKS: 15 and 17 Erie Street, - MILWAUKEE, WIS.

OUR LEADER FOR 1894.

Features.

Adjustable valves.
Superior in design.
Excellent in workmanship.
Cleaning burner attachment.
Great efficiency in doing work.
Extreme economy in gas consumption.

The drop door, unlike those on other ranges, is entirely new, simple and durable.



Our Goods are Superior in Quality of Material used and in Workmanship.

WILL MEET THE DEMAND.

We offer this line on its merits, coupled with the fact that its price is about one-quarter below any gas range heretofore offered by us.

We carry a full line of Heaters and Gas Grates.

Manufacturers of
Gas Stoves and Ranges,
Fire Places and Heaters
Laundry Heaters,
Hatters' Iron Heaters,
Ovens, Hotel Ranges,
Kilns for Firing China,
Kilns for Firing Glass,
Melting Furnaces,
Coffee Roasters,
Soldering Furnaces,
Bakers and Broilers.

OUR CATALOGUE AND DISCOUNT SHEET ON REQUEST.

SALESROOMS AND WAREHOUSES, { NEW YORK CITY, N. Y., AND CHICAGO, ILL.

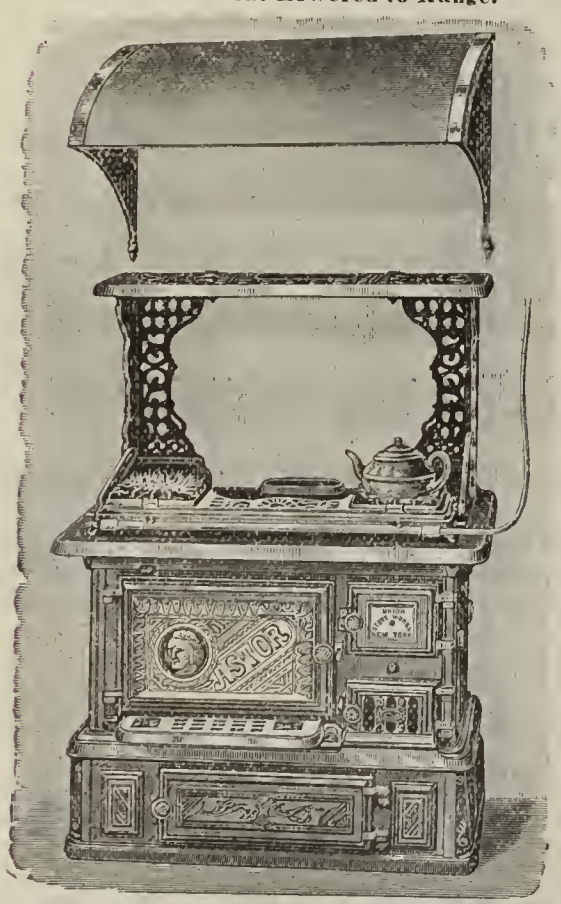
SALESROOMS ONLY, { SAN FRANCISCO, CAL., AND PORTLAND, OREGON.

NEW - PATENT - GAS - STOVE - ATTACHMENT.

PATENTED FEBRUARY 20th, 1894.

The only Practical, Common Sense Gas Stove Attachment for Cook Stoves and Ranges made.

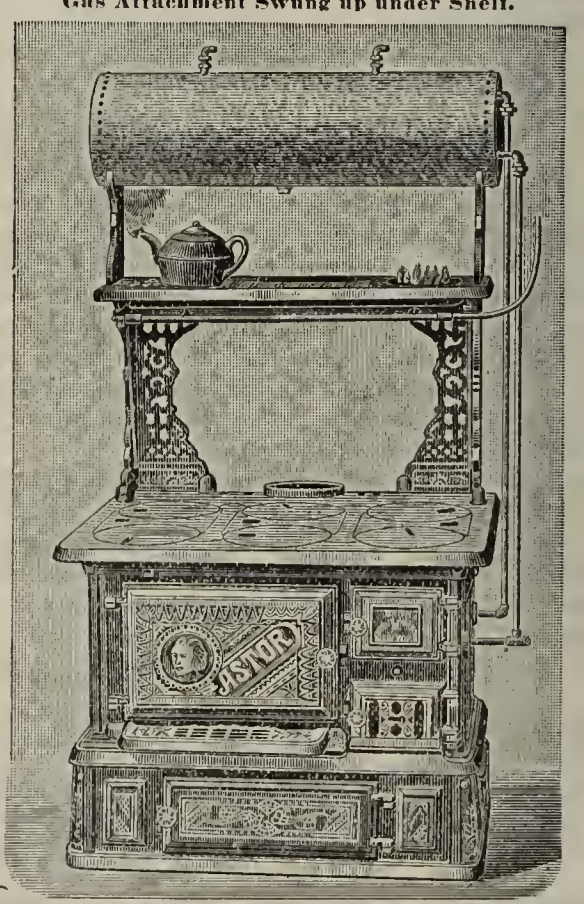
Gas Attachment Lowered to Range.



Adjustable to Our

No. 70 Astor.
" 7 "
" 2 "
" 3 "
" 3 West End.
" 8 Bon Bon.
" 3 "
" 8 Home Run.
" 3 " "
" 8 New Rival.
" 3 " "
" 8 Lakewood.
" 8 New Paragon.
" 9 " "
" 3 " "
" 4 " "
" 8 Durham.
" 3 "
" 8 Massena.
" 3 "
" 8 Paragon B.
" 3 " "

Gas Attachment Swung up under Shelf.

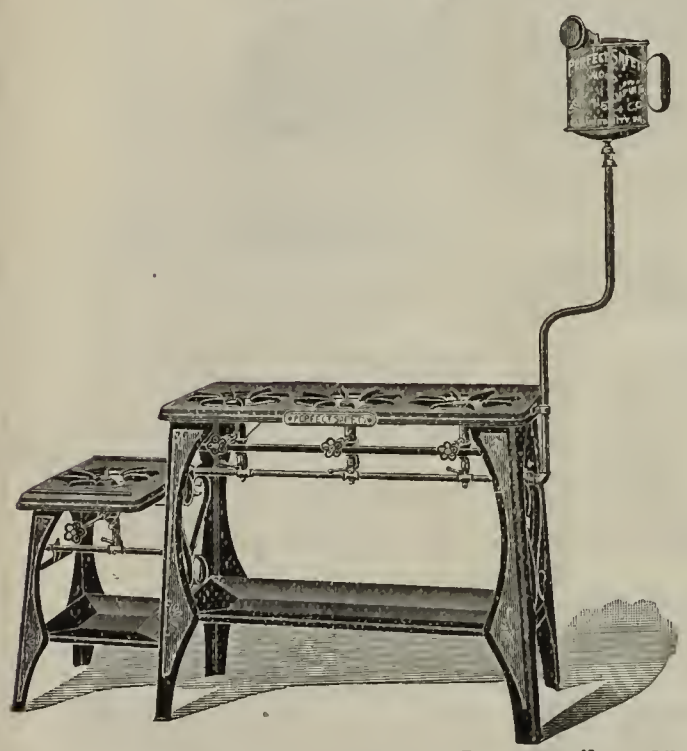


Is adjustable to all our **Portable** Astor and West End Water Back Ranges, whether they are connected to upright or **Horizontal** Boilers Also adjustable to our No. 3 Astor and West End **Brick-Set** Ranges and to nearly all our 8 and 9 inch Portable Kitchen Ranges, as above stated —— **Exclusive Advantages.**—The mantel shelf is not sacrificed when **our** Gas Stove Attachment is lowered to the range. **In Summer,** when lowered to position on top of the range, this Gas Stove Attachment may be used for all household purposes of cooking, etc., and a coal fire dispensed with entirely. **In Winter,** when folded up under the mantel shelf, it can be used as an assistant to the range, the shelf being provided with two boiler holes and kettle rests.

THE UNION STOVE WORKS, 70 Beekman and 66 & 68 Gold Sts., New York. U. S. A.

Perfect Safety Gasoline Stoves.

Our New Cheap Step Stoves.



Individual Burners on Top Double Burner on Step.

❋ ❋ Dimensions. ❋ ❋

	Height.	Top.	Height Step.	Step Top.
2 Burners and Steps,	29 in.	15 x 22	22 in.	12 x 18
3 " " " "		16 x 32	"	"

PROVIDED WITH OUR **Removable Automatic Shut-Off**

Perfect Safety Tanks.

We offer them at Hard Times Prices,

40 % Below the "Trust's" Prices.

They are Stamped Steel throughout, finely japanned and ornamented

Light, Strong and Durable.

Burners the best that can be made.

Will last 10 years with ordinary care.

Repairs cheap and easily made.

Will do as much work and as well as the

Fancy, High-Priced Stoves.

—SEND FOR PRICES.—

Ellwood Gas Stove & Stamping Co.,

Ellwood City, Lawrence Co., Pa.

LIST OF WHOLESALERS.

Barstow Stove Co., Boston.
E. B. Colby & Co., New York.
W. S. & M. Lieber, Philadelphia.
Wm. J. H. Gluck, Baltimore.
The F. H. Lawson Co., Cincinnati.

H. Rendtorff & Co., Chicago, Ill.
Herboth Mercantile Co., St. Louis.
Townley Metal Co., Kansas City.
Famous Stove Co., Indianapolis.
Demmler Bros., Pittsburgh.



"Columbian=Garland"

New Wrought-Steel Range. A Product of the Columbian Year.

In the "Columbian-Garland" Range we have produced one of moderate price; strong, durable and desirable in every way, possessing all the advantages of higher-priced goods, made of the best material and by the most experienced workmen.

Merchants will find the "Columbian-Garland" Range the best of its kind, and a dependable article in every particular.

ILLUSTRATED DESCRIPTIVE CATALOGUE MAILED ON APPLICATION.

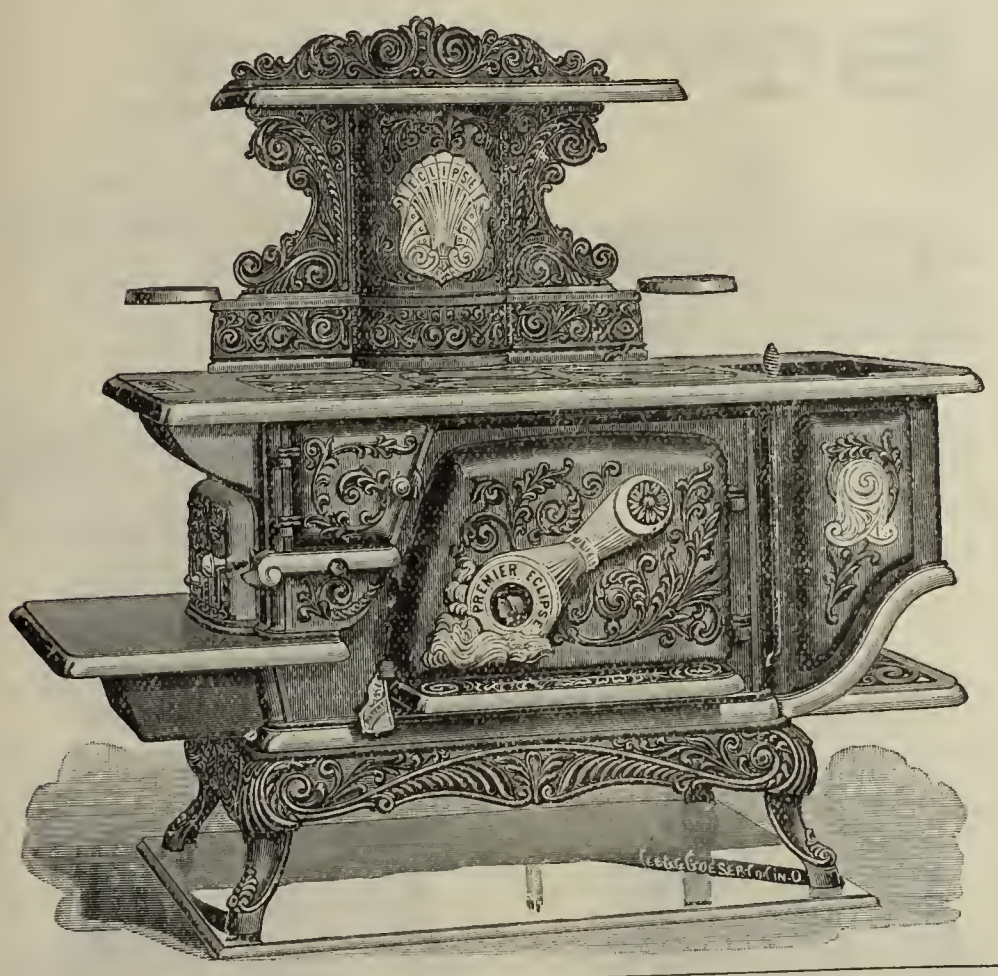
GARLAND STOVES AND RANGES "The World's Best"

The Michigan Stove Company,

Largest Makers of Stoves and Ranges in the World,

DETROIT, CHICAGO, BUFFALO, NEW YORK CITY.

The Premier Eclipse

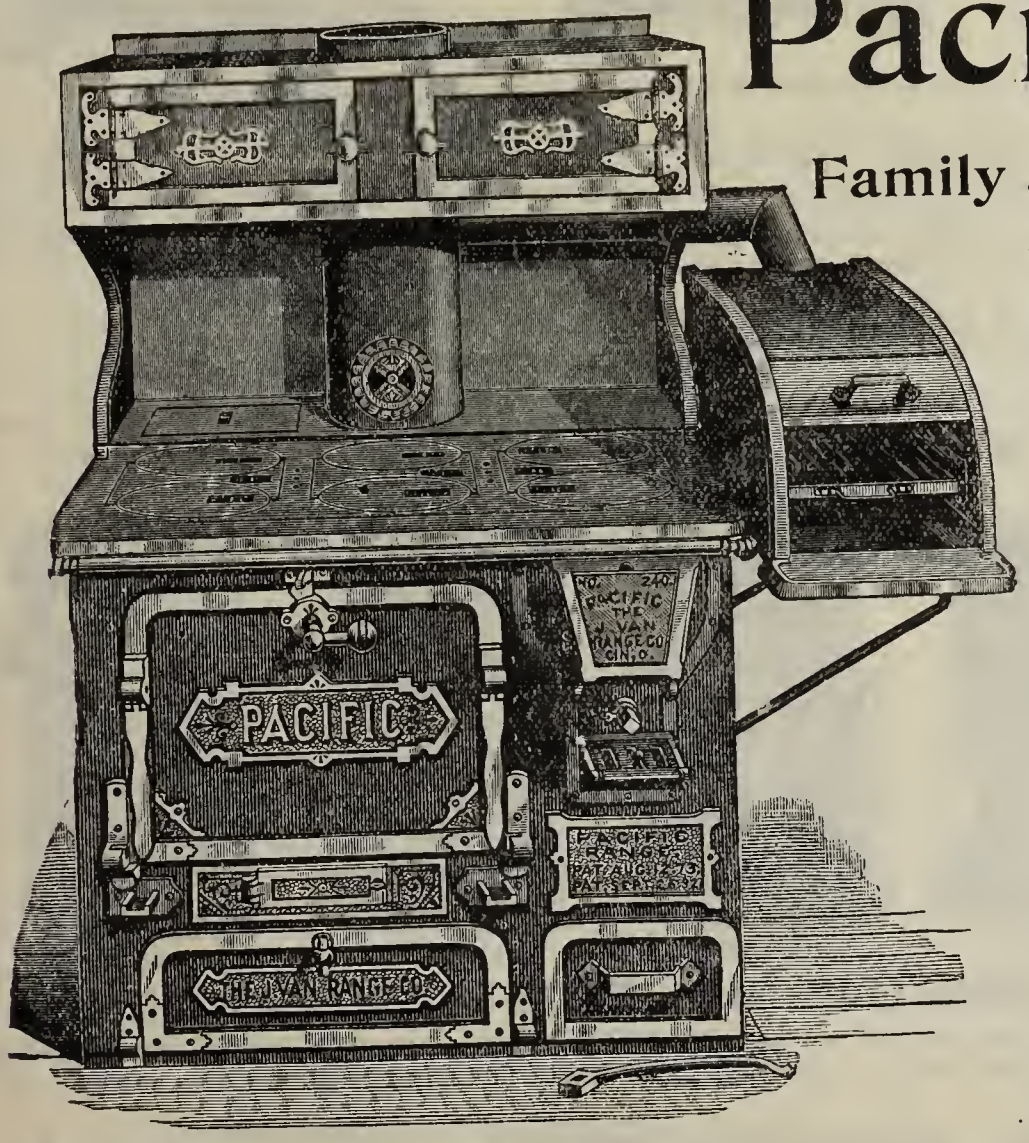


With Encased Bracket Reservoir and High Shelf. Six Holes. Coal or Wood. Two sizes. Pouch or Top Feed. Everything about this Range is new and modern. A perfect Baker and Roaster and the best construction of the present time. The dealer sells it on sight and it never causes complaint. Write for Catalogue.

THE Eclipse Stove Co.,

Mansfield, O.

Pacific



Family and Hotel Ranges.

For Soft Coal, Wood or Natural Gas.

The finest, most substantial Wrought Steel Range ever offered the trade at a low price. The "Pacific" is one of the few good ranges being offered, and the dealer desiring something that will

"STAY SOLD"

should get our prices and cata.

ADDRESS

The John Van Range Co., = Cincinnati, Ohio.

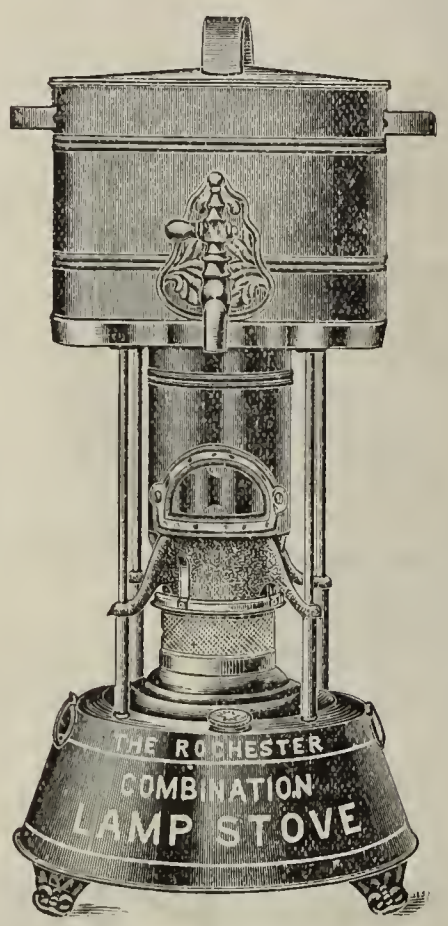
The Rochester

(CENTRAL DRAFT)

OIL STOVES.

No odor ever comes from this Stove.





Perfect combustion—equal to the finest Rochester Lamp

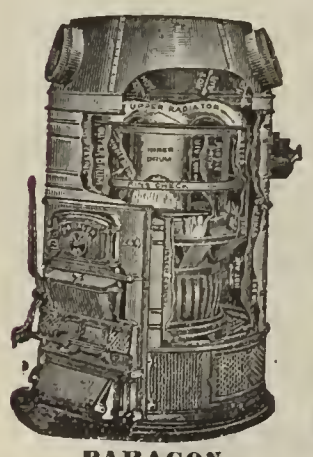


A PERFECT OIL STOVE AND COMPLETE ROCHESTER LAMP ALL COMBINED IN ONE.

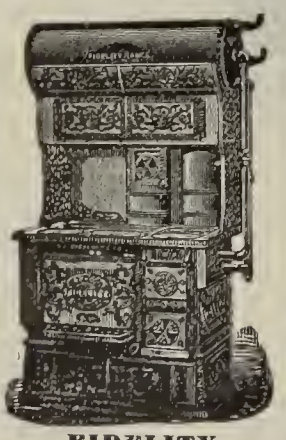
This new Oil Stove was brought out last season and has had a remarkable sale. It is well known that the famous Rochester Lamp has proved to be the best lamp **EVER MADE.** This is saying a great deal, for lamps have been made and used for over 3,000 years ; nevertheless it is true. Our Oil Stoves and Heaters are made on the same principle as the Rochester Lamp ; have the Rochester Central Draft Burner (circular wick) with double over-cone (or perforated flame spreader). All brass burner and wick-lift. Above illustrations show No. 2 size, which **CAN BE INSTANTLY CHANGED INTO A ROCHESTER TABLE LAMP** as shown. Send for our price-list and discounts to the trade.

ROCHESTER LAMP CO., 42 PARK PLACE, 37 BARCLAY STREET, NEW YORK.

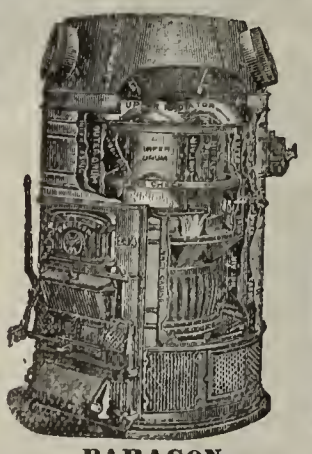
A CONTINUAL PROCESSION OF



PARAGON.



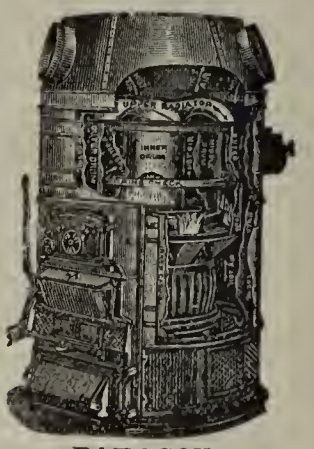
FIDELITY.



PARAGON.



FIDELITY.



PARAGON.

PARAGON FURNACES and FIDELITY RANGES

Is moving steadily from our works to the homes of delighted purchasers, by way of the stores of enterprising dealers, who have found profit in aiding the course of the procession. You can get into line if you will.

Isaac A. Sheppard & Co., Manufacturers, 1801 N. Fourth St., Philadelphia, Pa.

Gem=Climax

FOR COAL OR WOOD



Ranges

made in all the various styles and sizes. The Flattering Success of the Gem-Climax medium priced, four-hole range is in keeping with all the

SEND FOR CATALOG.

Climax Stoves and Ranges.

TAPLIN, RICE & CO., AKRON, OHIO.

WRITE TO * THE · DIPPO · MANUFACTURING · COMPANY, CHAGRIN FALLS, * OHIO,

FOR THEIR

NEW ILLUSTRATIVE AND DESCRIPTIVE CATALOGUE, * *TO BE ISSUED MAY 1st.* * **FERROSTEEL RANGES.**



This range was advertised last year with triangular grate. Now it has triangular, duplex, or flat. All that is needed to change from one style to either of the others is a new number-plate. No changing of bricks or grate frame, nor even taking them out.

Let us send you a full description.

THE STAMFORD FOUNDRY COMPANY,
STAMFORD, CONN.

Luther & Lederhos,

MANUFACTURERS OF



Gas and Oil Stoves,

30 Cliff St., N. Y.

Write for Catalogue and Prices.





Established 1827.

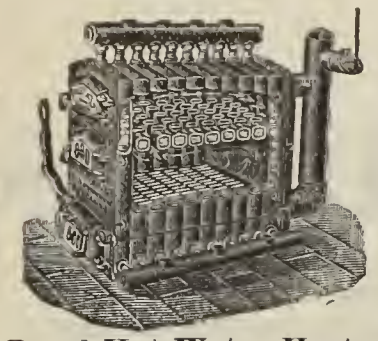
W. Jackson's Sons,

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons. Andirons, Tiles, &c.

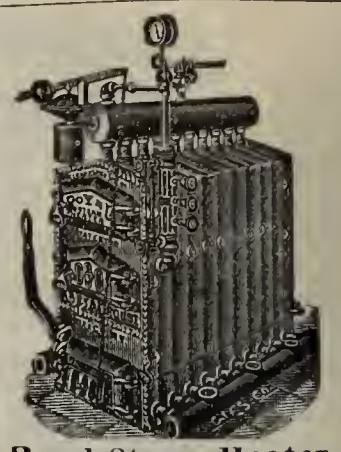
Office and Showrooms, 246 Front Street, within three minutes of Fulton Ferry. Factory, 268 Water Street, New York.

Sold on their Merits,

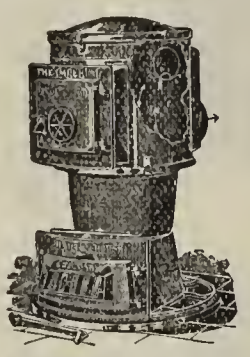
and not on their Antiquity.



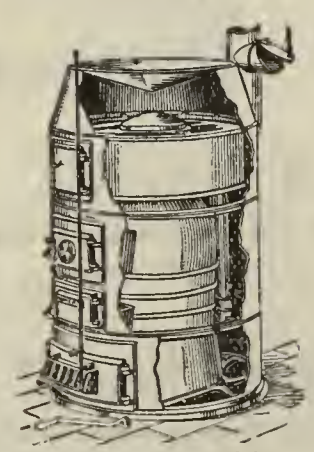
Royal Hot Water Heater.



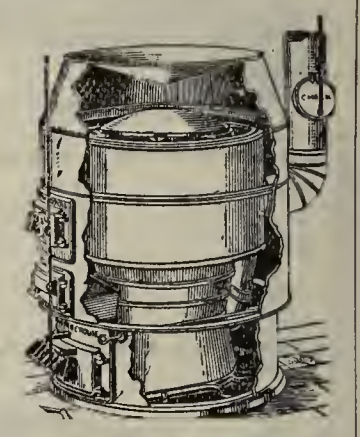
Royal Steam Heater.



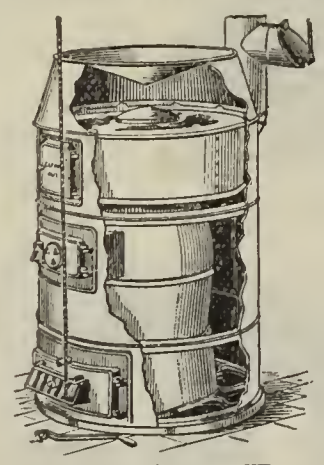
Imperial Hot Air Furnace.



Royal Hot Air Furnace.

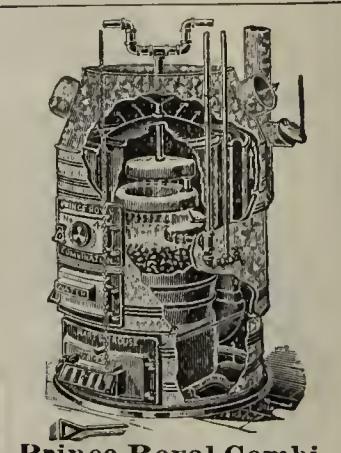


Prince Royal Hot Air Furnace.



Royal Victor Hot Air Furnace.

ROYAL HEATERS



Prince Royal Combination Heater

Hart & Crouse,

No. 1 Cornelia Street, UTICA. N. Y.

CHICAGO, 79 LAKE STREET.

W. M. MACKAY, Manager Hot Water and Steam Dept., No. 211 Water St., New York.



KEEP IN MIND

The Plummer Steam Heater
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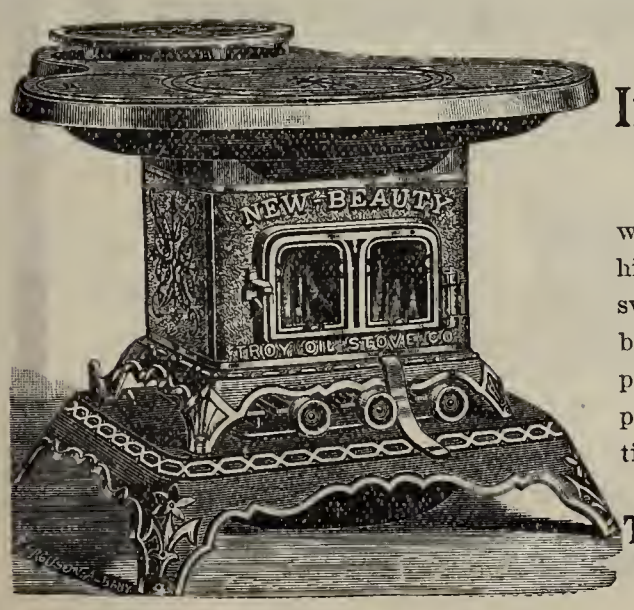
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"Mrs. B—— would be oblieg if will a good strong per Bilis to blew fire, 2s. per. have send the money with my girl."

"3 Peans of glas for Mrs. G——.

"12 7 aits [12⅞] Bey 11 and a ait [11⅛].

"3 Pound of Potey.

"1 Shet of Perfeated Sink.

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— WHY SHE WAS TIRED —"You look tired, my dear," said Mr. Newlywed to his wife, who is a Vassar graduate.

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—BY—

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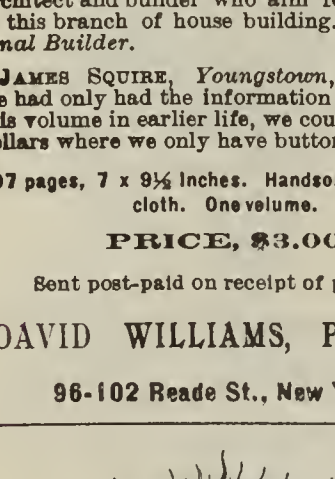
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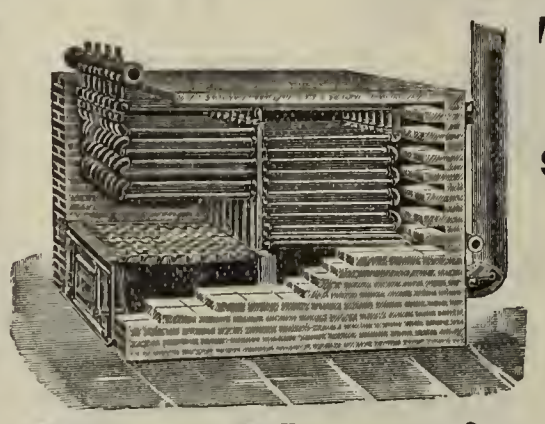
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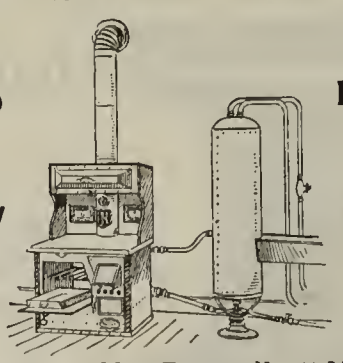
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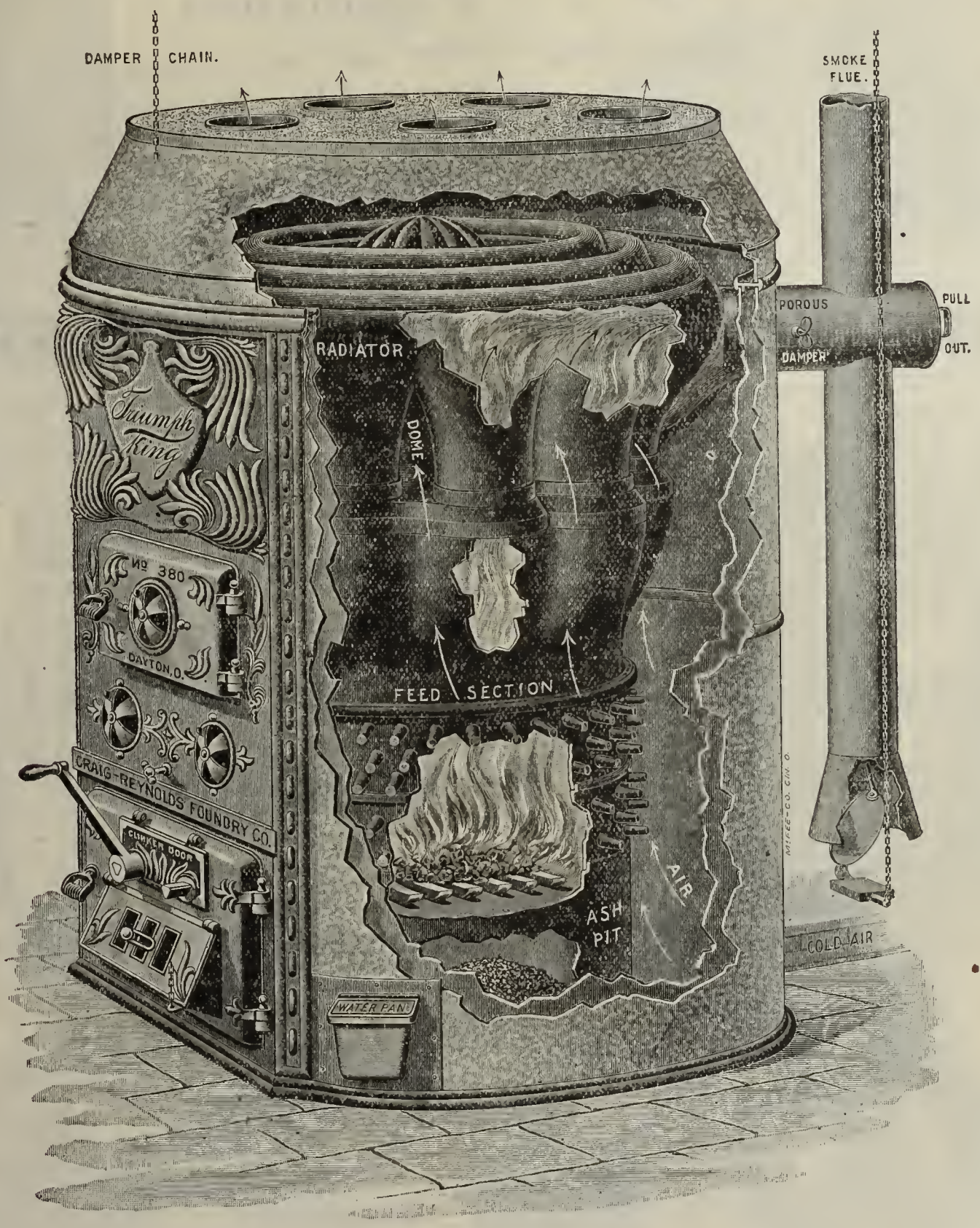
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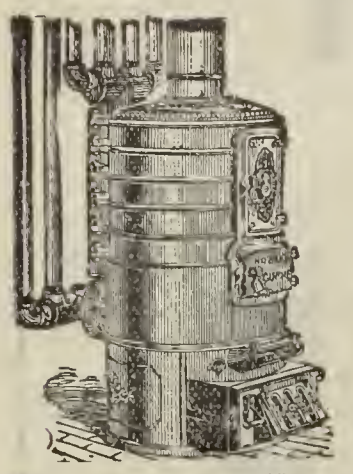
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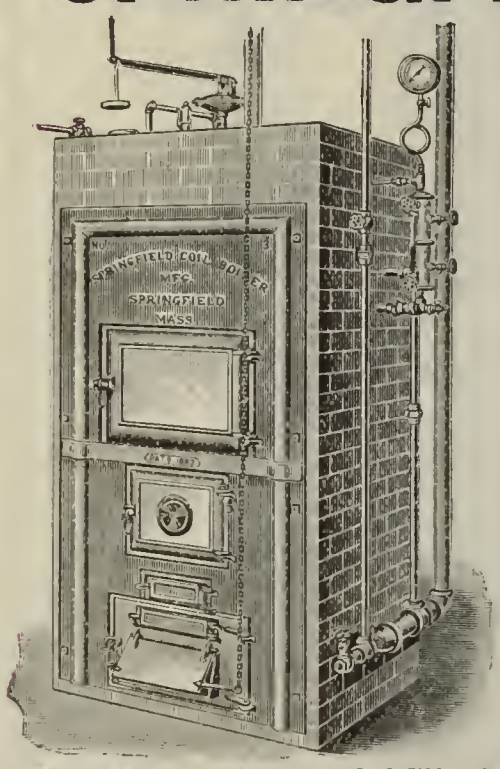
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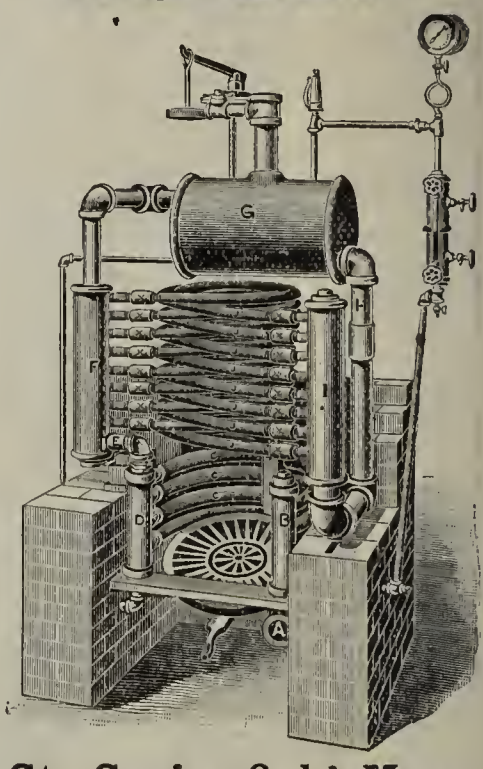


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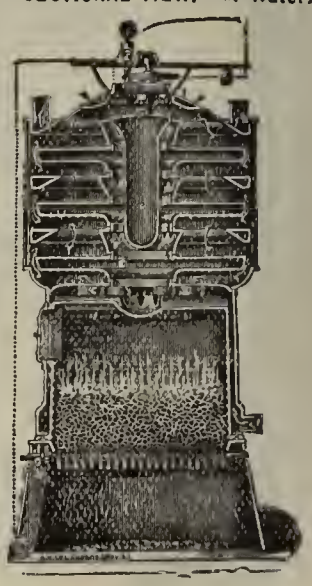
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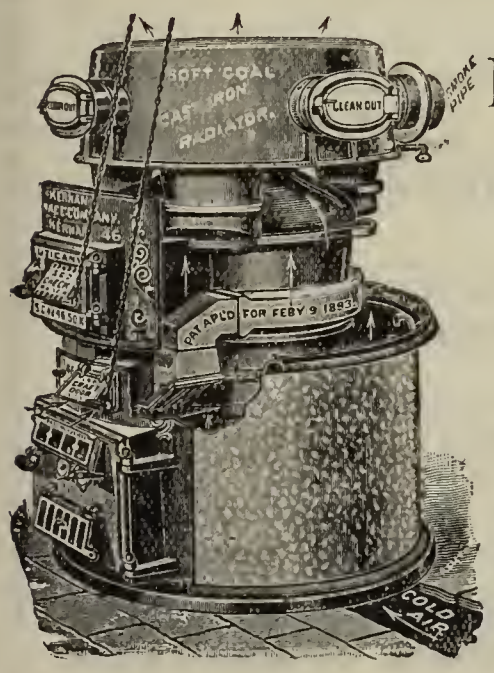
Tommy's Pop: "Umph—umph—whadoiknowaboutit?"

Tommy: "Do they each have a dog watch?"

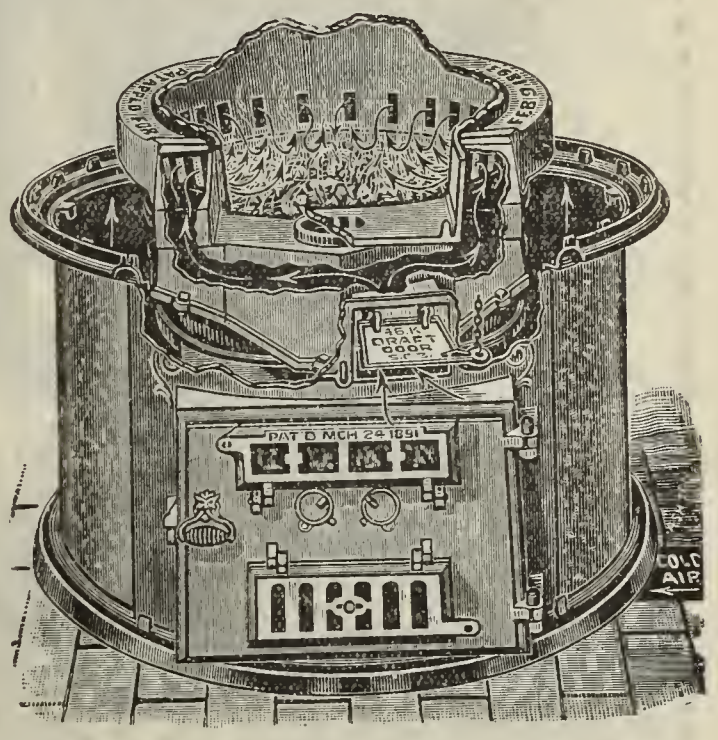
Tommy's Pop: "—!! —!!! —!!!!"

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New Process Radiators, Always Clean.

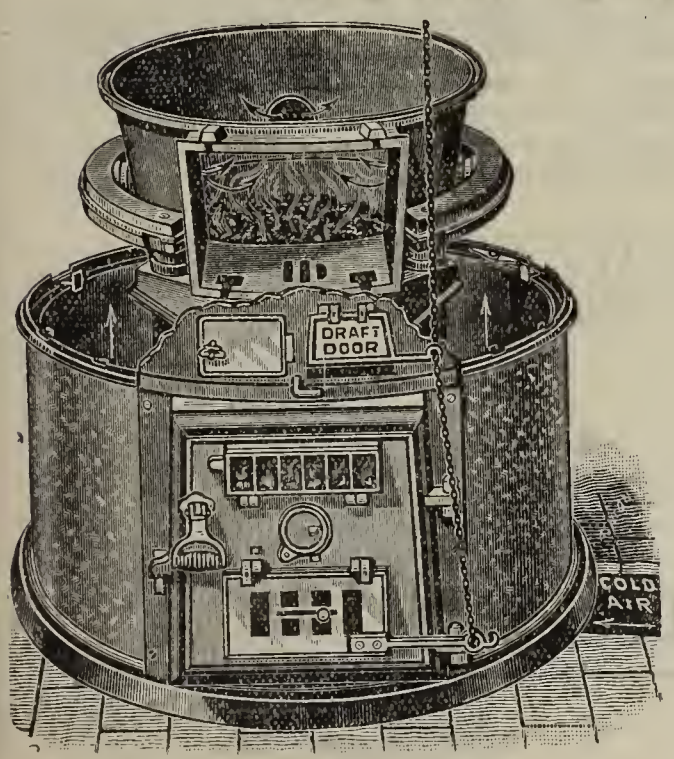


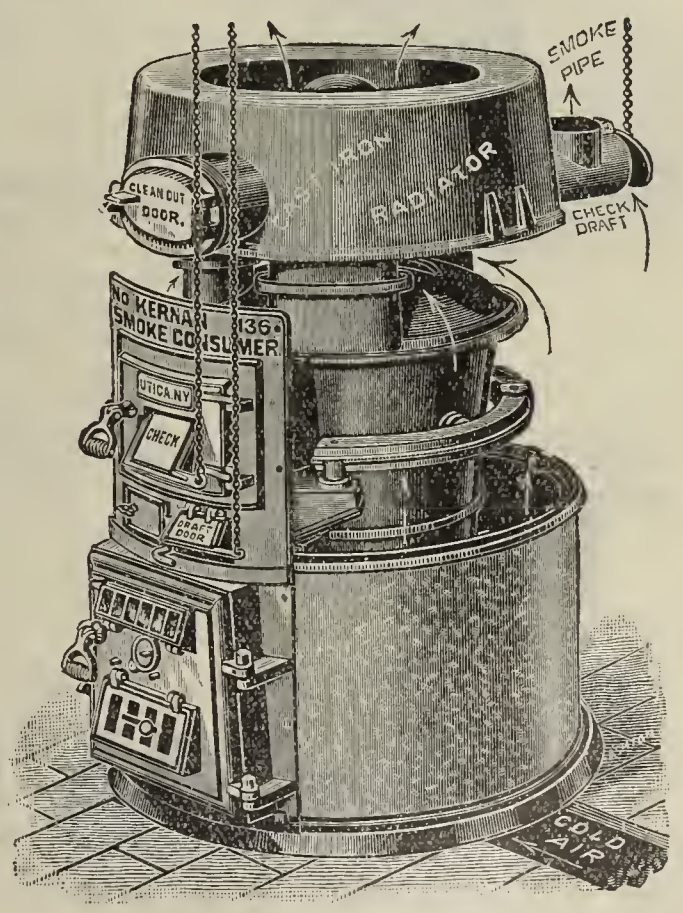
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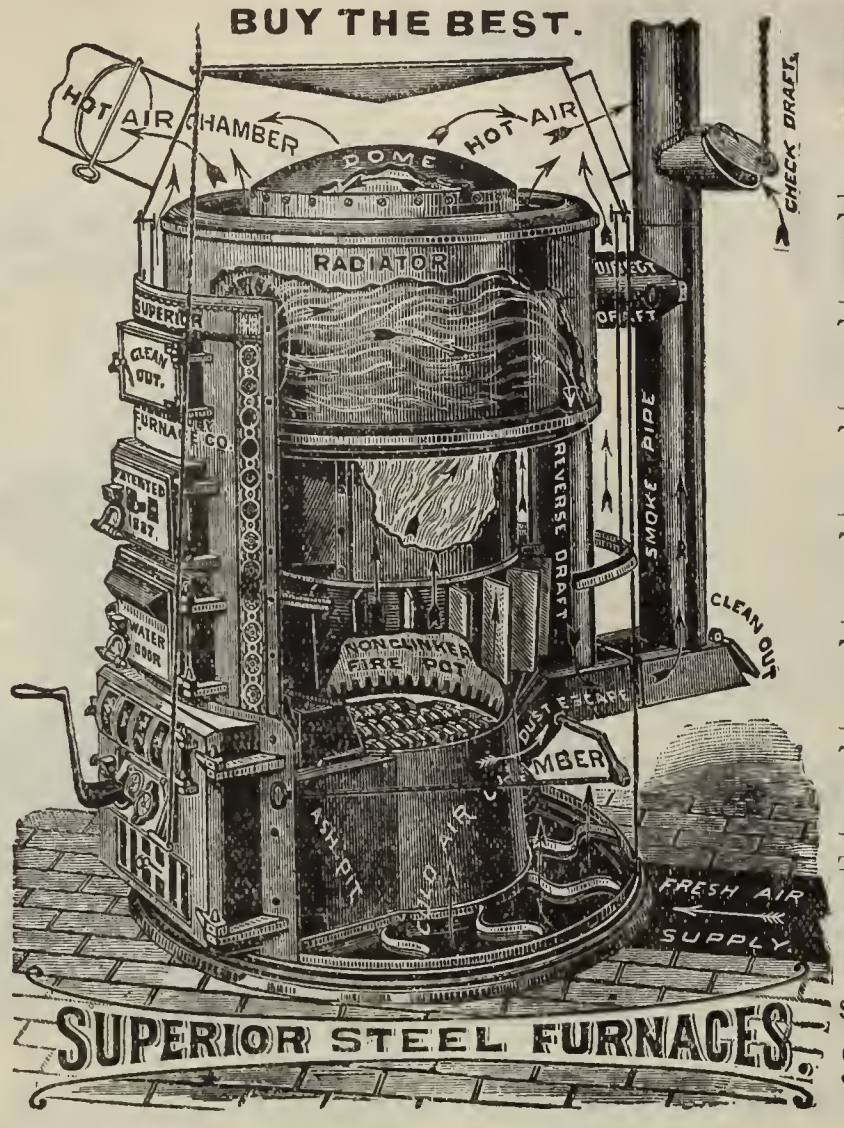
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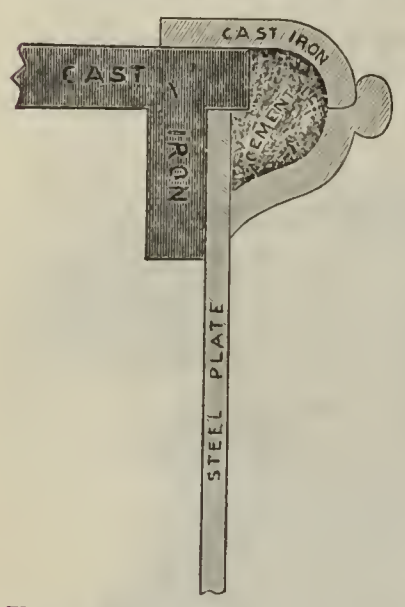
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This is the name selected by the judges as the best and most appropriate for our new heater.

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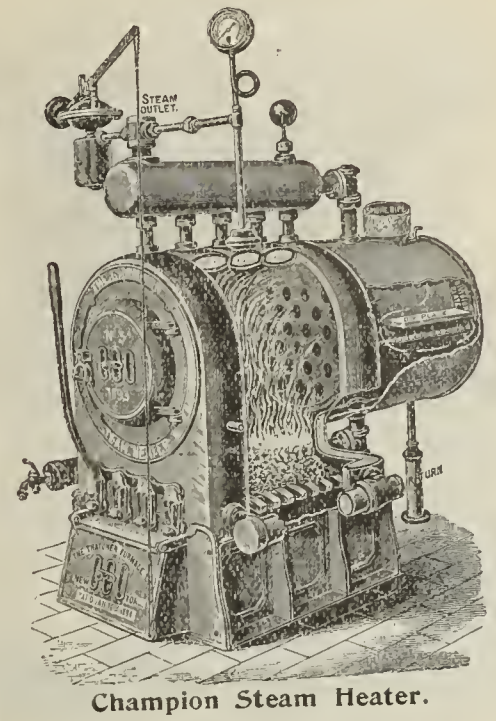
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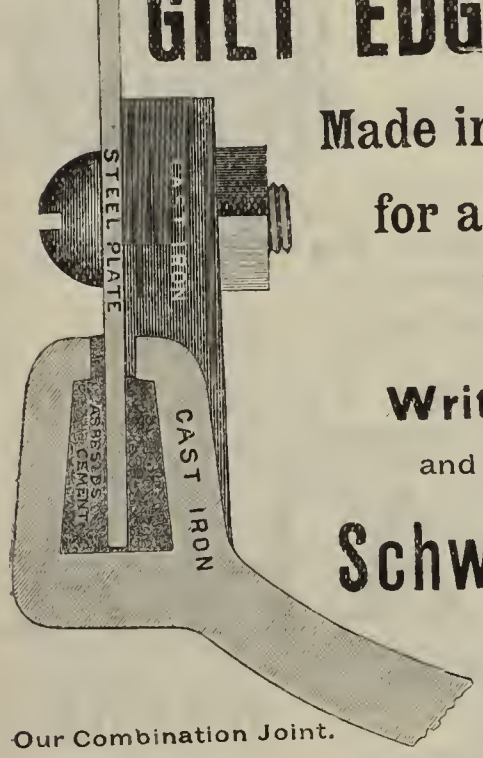


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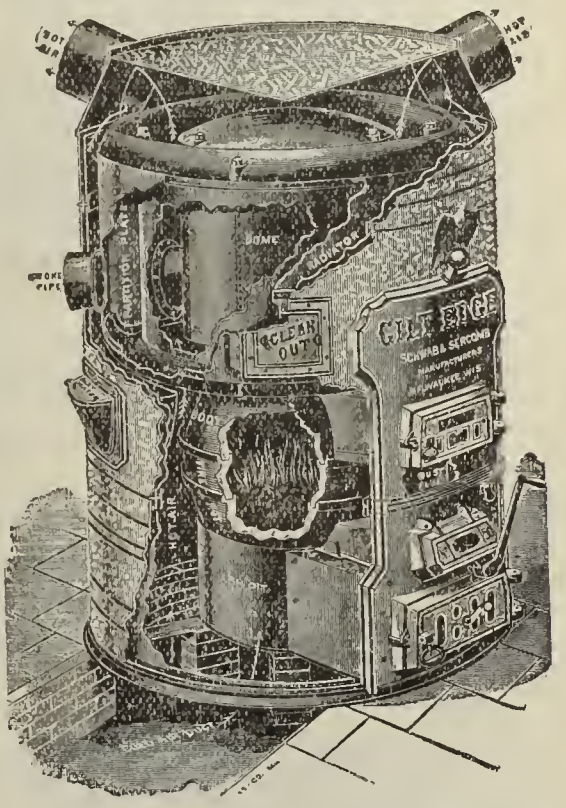
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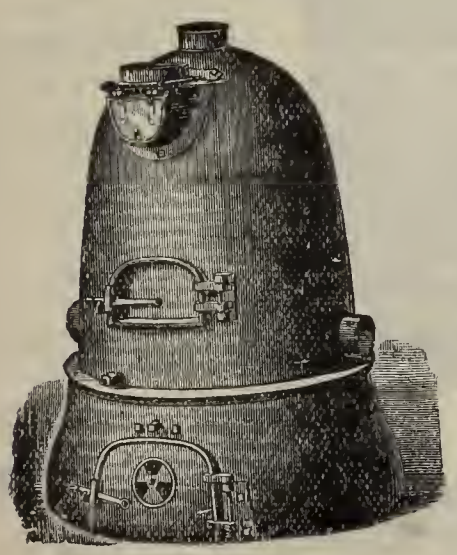
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ESTABLISHED 1859. INCORPORATED 1893.

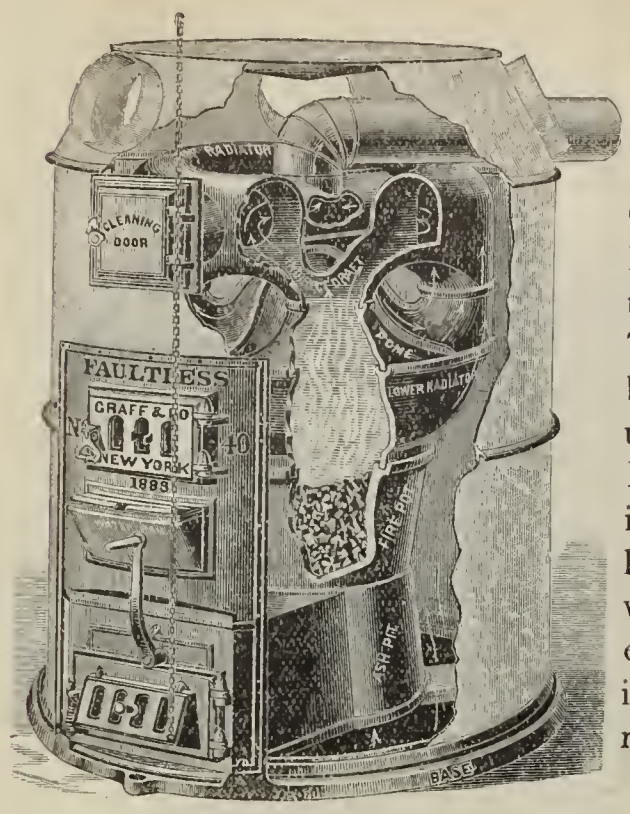
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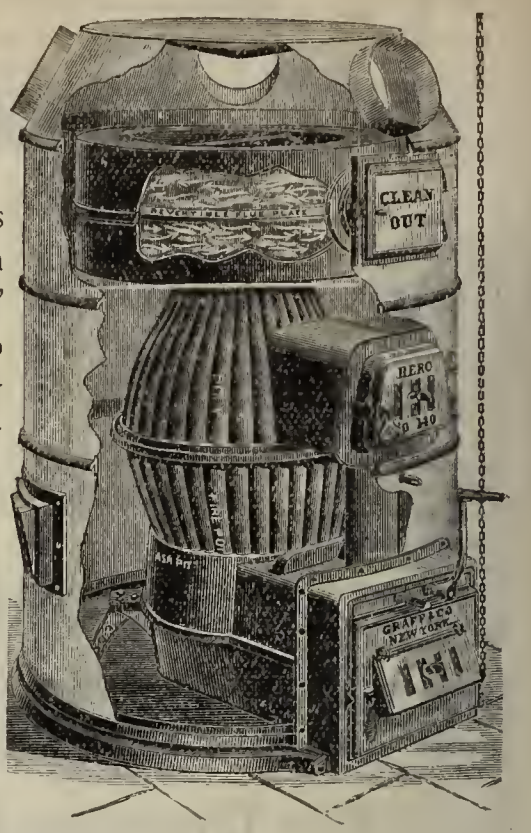
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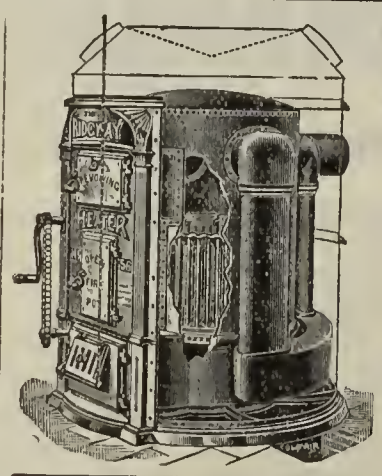


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OPEN FIRE POT.
The Best Furnace Made.
HIGHEST AWARD AT WORLD'S FAIR.

SEND FOR CIRCULAR.

RIDGWAY FURNACE CO.,
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A Lesson in Finance

One of Spokane's bank presidents has a habit of taking an airing each evening on the front end of a street car absorbing ozone and throwing off the cares of business while chatting with the motorman. The other night he met a genius, and his match. The story was too good to keep and finally reached the Spokane *Tribune*, which publishes it as follows:

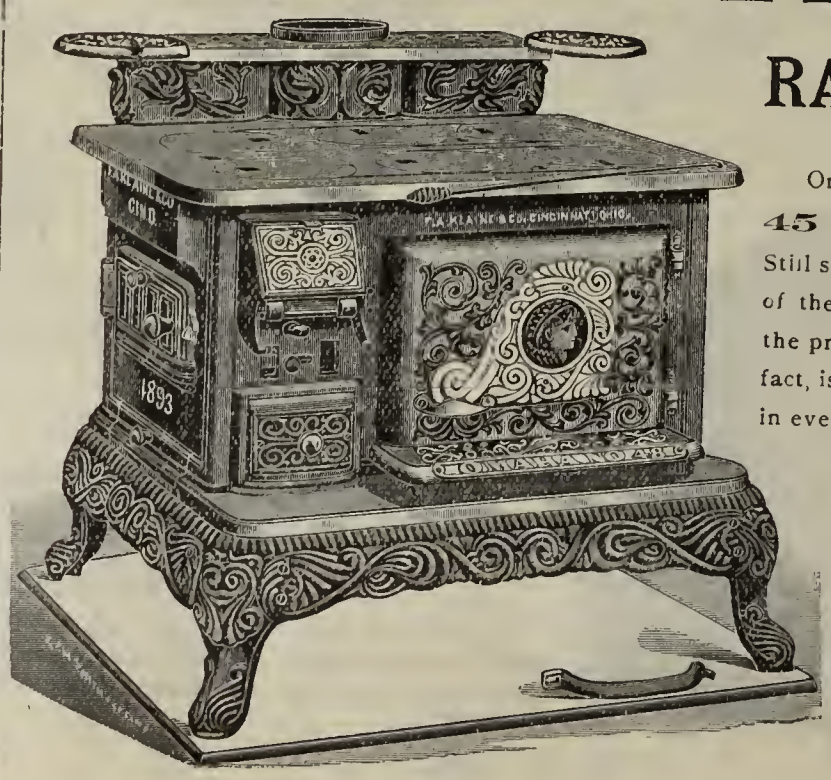
After the usual exchange of courtesies the motorman said:

"Mr. Blank, you consider yourself a financier, I suppose?"

"Yes," replied the banker, "I guess I am, or I could not hold my job."

"Well, you don't know anything about financiering," the motorman made bold to state. "But my 'boss' [referring to the president of the street car company] is a first-class financier, he is. Why, do you know that every Sunday he advertises for a servant, and Monday 20 or 30 girls ride out to his house, near the end of the line, to get the place, but find madam can't see them; so they ride back, and repeat the journey several times before they are finally told that the old girl has decided to stay a while. Now, that's financiering. Fifty cents paid out for advertisements and $8 or $9 taken in for car fares to swell the annual dividends of the boss' company."

BUY OMAHA



RANGES

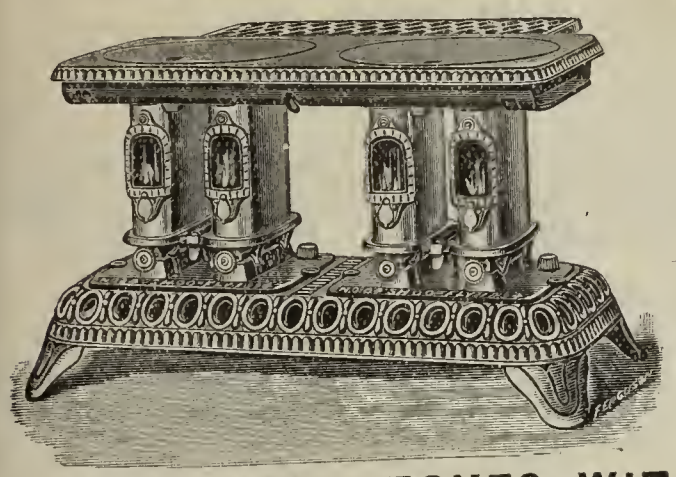
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45 YEARS.
Still superior to many of the productions of the present time. In fact, is a modern stove in every respect.

Write for catalogue.

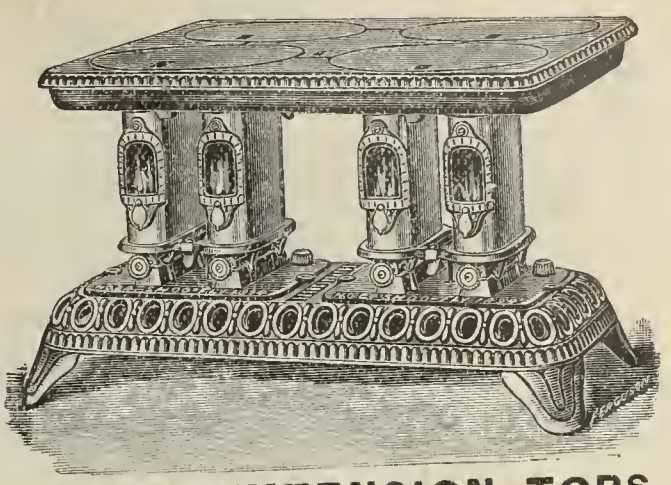
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F. A. Klaine & Co.,
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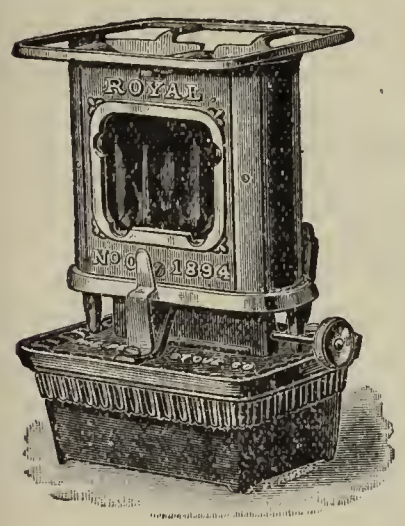


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DOUBLE OIL STOVES WITH 2 AND 4 HOLE EXTENSION TOPS.

Made for Convenience, Economy of Oil, and sold at Low Price. Can be used Single or Double, as they are two independent stoves.



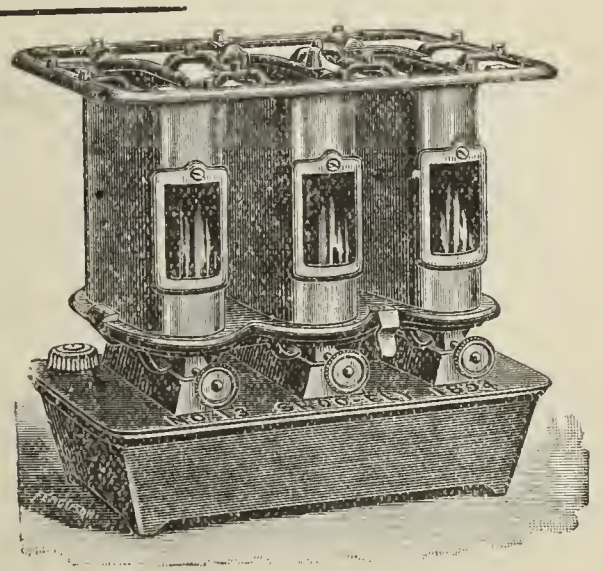
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LAMP STOVES.

THREE NEW LINES,

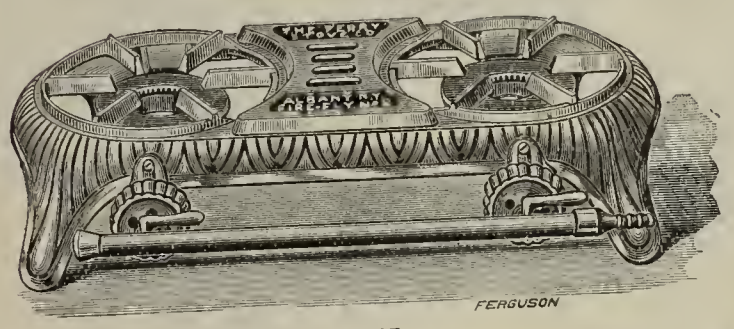
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One, Two, Three Burner.



SHOO FLY LAMPS.

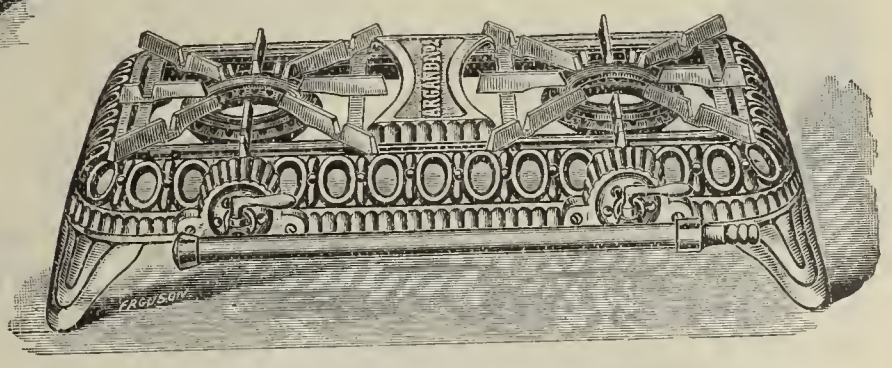
GAS STOVES, TWO NEW LINES.



FIRE-FLY.
1, 2, 3 BURNER.

These Gas Stoves are the very best made, yet they are sold at prices to meet the times.

They are handsome and attractive, and all have our improved Burners. Full Nickel, White Nickel, Plain.



ARGAND.
1, 2, 3 BURNER.

SPECIAL

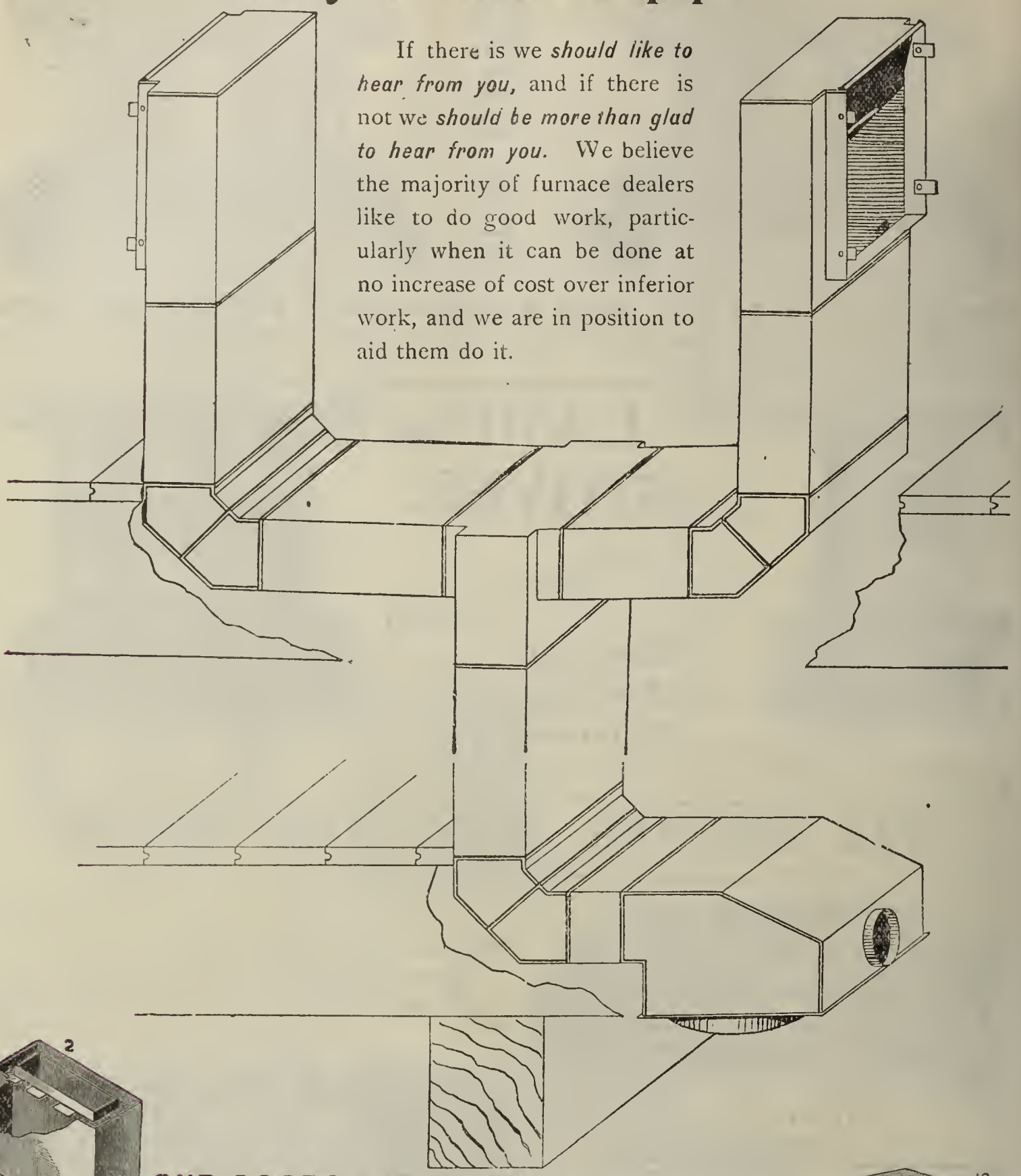
Flush Top Surface,
Removable Gratings,
Removable Burners,
Removable Burner Tops,
High Legs.

WE MAKE A SPECIAL EXTENSION TOP FOR GAS STOVES.

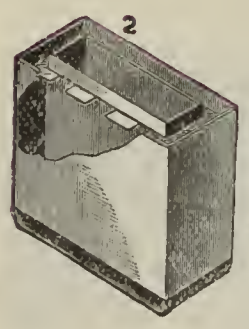
THE PERRY STOVE CO.,

ALBANY, N. Y. NEW YORK CITY.

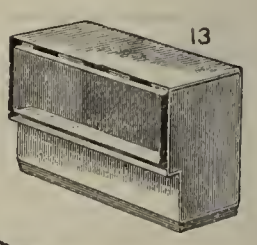
Is there any good reason why we cannot sell you furnace pipes?

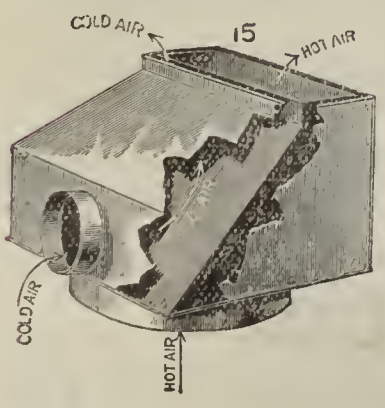


If there is we *should like to hear from you,* and if there is not we *should be more than glad to hear from you.* We believe the majority of furnace dealers like to do good work, particularly when it can be done at no increase of cost over inferior work, and we are in position to aid them do it.



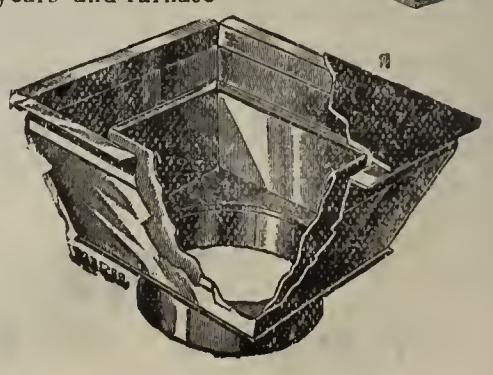
OUR GOODS ARE RIGHT,
OUR PRICES RIGHT,
OUR TERMS RIGHT,





And if you'll give us the opportunity, will convince you of their *quality, convenience* and *utility.*

We have been furnace dealers for twenty-five years and furnace pipe manufacturers for six years, and during that time it's fair to suppose have learned the requirements of the trade. Shall be glad to mail you catalogue, price-list and discounts.



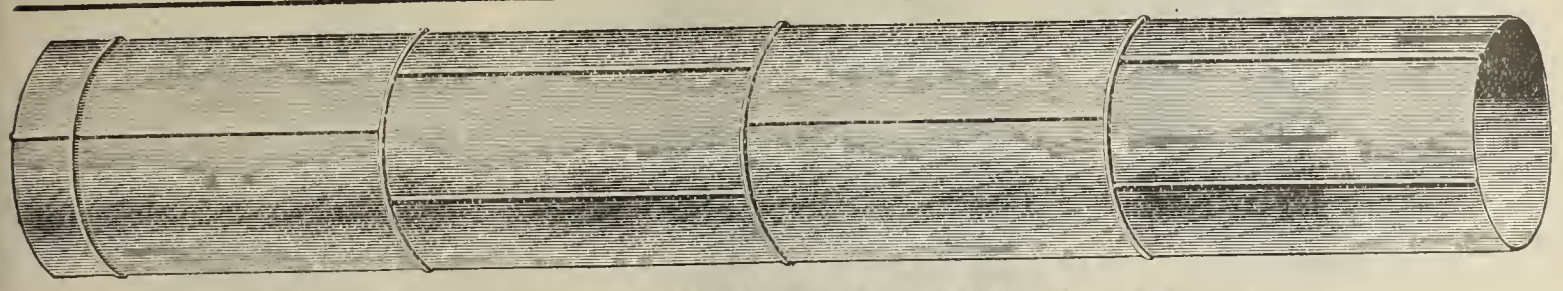
SAFETY FURNACE PIPE CO.,

Nos. 11 and 13 Atwater St., E.

DETROIT, MICH.

Eastern Agents, Riter Bros. & Co., Philadelphia, Pa

Cut Out the Coupon if You Want to Save a Dollar!



FULLY FIFTY THOUSAND DOLLARS

are wasted annually in material alone by Furnace Dealers who make slip joint pipe. This large sum (and more) can be saved by buying our

Machine Made Double Seamed Hot Air Pipe.

Smooth as a Bore—No Solder—No Buckling—Air Tight—Dust Proof!

NOTE THE PRICES ON IC. IX 20% ADVANCE ON LIST BELOW.

Per Foot: 7 in. 10c., 8 in. 11c., 9 in. 12c., 10 in. 13c., 12 in. 17c., 14 in. 25c., 16 in. 30c., 18 in. 35c., 20 in , 45c., 24 in. 65c.

These prices f. o. b. cars Chicago on orders of 100 ft. of pipe of two or more sizes. Terms 30 days net, with allowance of freight to points between Omaha and Boston if bills are paid in 10 days. To dealers who have never used these Fittings we will allow the sum of $1.00 on their first order for $10.00 or more if order is accompanied by coupon. Full lists of Furnace Fittings on application to

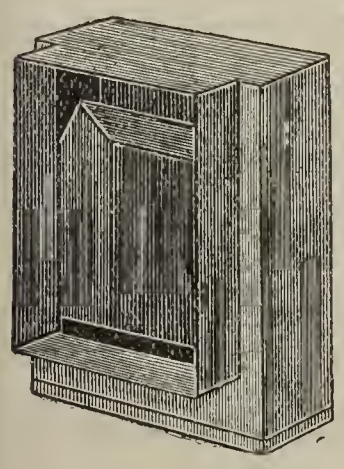
Metal Worker Coupon No. 3. Value $1.00 on first order of Fittings of $10 00 or more.

The Excelsior Steel Furnace Co.

(Duplicates Void.)

THE EXCELSIOR STEEL FURNACE CO.,

38 W. Monroe Street, Chicago.



Novelty Ventilated Wall Pipe,

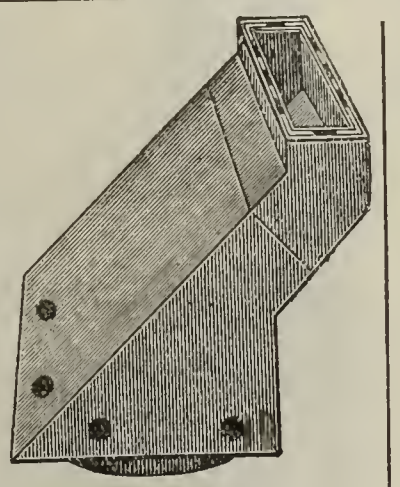
Absolutely Fire Proof.

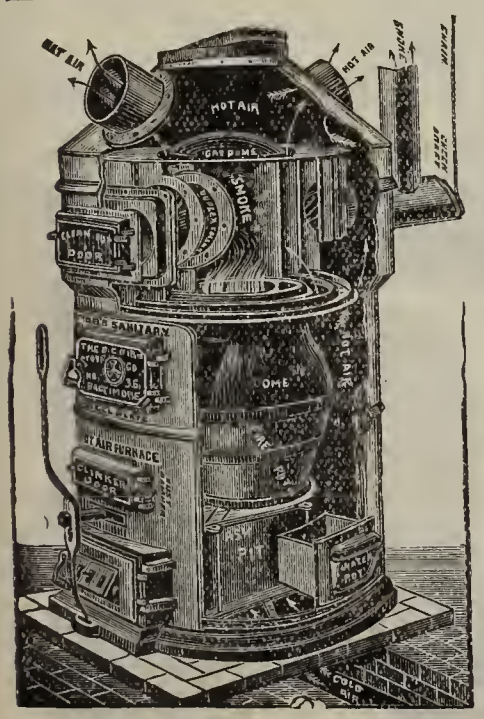
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER.

18 Wood Street, Pittsburgh. Pa.





THE B. C. BIBB STOVE CO.

BALTIMORE, MD.,

Manufacturers of

THE BIBB SANITARY HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

Baltimore Fire Place Heaters,

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW-WARE, &c.

Send for Catalogue with Testimonials.



Wasted Scraps of Time.

Dr. A. S. Allibone, compiler of the dictionary of authors, and a most industrious and methodical man, used to inclose in all his letters a card whereon is printed:

"What does it matter if we lose a few minutes in a whole day?

"Answer: Time table (working days in a year, 313; working hours in a day, 8). Five minutes lost each day is in a year 3 days, 2 hours, 5 minutes; 10 minutes is 6 days, 4 hours, 10 minutes; 20 minutes is 13 days and 20 minutes; 30 minutes is 19 days, 4 hours, 30 minutes; 60 minutes is 38 days, 1 hour."

— AN ENCORE.—"How did your son do at college last year, Mrs. Wilkins?"

"Very well, indeed. He did so fine as a freshman that he got an encore."

"A what?"

"An encore. The faculty have requested him to repeat the year."—*Harper's Bazar.*



A Poetic Ironmonger.

At the sign of the "Golden Saw," in Peterborough, says *Ironmonger* of London, the Muse of rhyme and verse has made common cause with such unpoetic things as tools and cutlery, and the genial master of the place—he must be genial or he could not advertise his wares in rhyming stanzas—has sent us a specimen circular wherewith he cheers and and amuses his patrons, the while dropping seeds of reason into their minds to fructify into purchases. We have not space for the whole of this Ballad of Hardware, which reaches the very respectable length of upward of 100 lines, but we may dip into it here and there and cull a posy or two for remembrance. The author will pardon us if we smooth the meter a trifle without detracting from sense or flow. He begins :

Yes, this is the "Golden Saw," as you see,
Where goods are sold well and as cheap as can be :
Knives with blades from one to six,
Little and big—they'll cut thick sticks.

* * * * * *

Of table cutlery I keep a stock,
Loosed or cased with a key and lock ;
Old stag horn handles for heavy wear,
Or buffalo for appearances fair :
Though you'll agree,
That with ivory
There's nothing for handles that can compare.

* * * * * *

Electro and silver plate I keep.
Would you make a present ? Give me a peep.

* * * * * *

Of scissors all sizes I keep by me,
Nail, button hole and embroidery :
For pruning and paper hanging, too,
Or cutting flowers—they're all on view.

* * * * * *

Mechanics and artisans, you I call near,
The tools you require you are sure to find here.
Straightedges, calipers, spring dividers,
Rules and bevels and coach makers' spiders ;
Squares of wood, steel or iron, they're made,
Adapted to each one's special trade.

* * * * * *

And of furnishing goods a fine stock have I,
From basement to garret—to please you I'll try.
For the garden, the greenhouse, the farm or the field,
My stores for them all a rich supply yield.
So kindly look in from near and from far,
And see—Yours most respectfully, A. J. R.

— Ungrateful.— She : "You abominable man ! No flowers, no reception, barely a pleasant word—and I have been away eight weeks ?"

He: "You are right—I am, indeed, an ungrateful wretch."—*Fliegende Blaetter.*

— Lucidity and Simplicity. — The Frenchman asked the American sparmaker what he was making.

"A yard," was the reply.

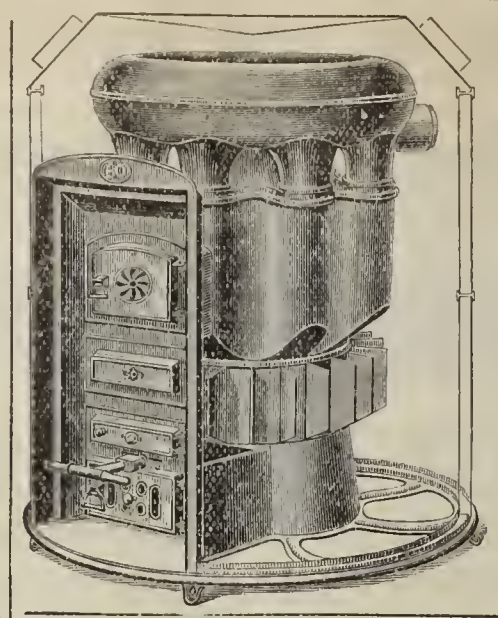
"How much have you got done ?" was the next question.

"A yard."

"Where did the spar come from ?"

"The yard."

And the Frenchman was very much surprised at the lucidity of the answers and amazed at the simplicity of our language.



CORY'S

ALL CAST IRON

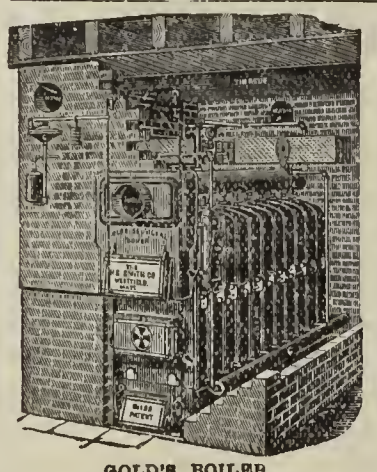
GAS-TIGHT FURNACES.

The purchaser will never ask if this is the *best* quality made, as all dealers understand the "Cory Furnace" to be only of *cast iron*, without bolted joints ; gas-tight and durable. Quality exactly the same in twenty sizes from $35 to $125.

UZAL CORY & CO.,

210 Water St., New York.

Established 1847.



GOLD'S BOILER

THE H. B. SMITH CO.,

MANUFACTURERS OF

Steam and Water

Heating Apparatus

FOR

PUBLIC BUILDINGS AND PRIVATE RESIDENCES

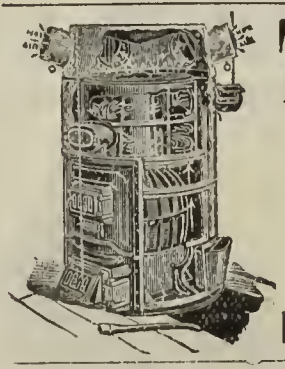
SPECIALTIES:

Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
Reed's Improved Cast-Iron Radiators,
Gold's Indirect Pin Radiators,
Breckenridge's Patent Automatic Air Valves.
Mercer's Patent Improved Sectional Boiler for Hot Water and Steam Heating, adapted for hard or soft coal.

Office & Warerooms, 137 Centre Street, New York.

FOUNDRY, WESTFIELD, MASS.

Catalogues Sent on Application.

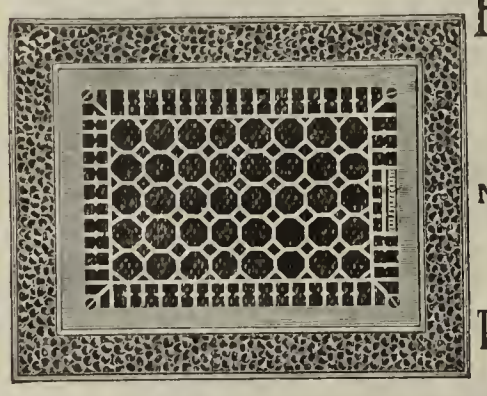


The Boomer is a Success.

Guess which is one of the Leading Furnaces offered for sale to-day.

Write for Catalogue, which explains all about the Boomer.

HESS, SNYDER & CO., MANUFACTURERS. Massillon, Ohio.



Registers and Ventilators.

SEVENTY SIZES,

ALL STYLES,

NEW AND ELEGANT DESIGNS.

Manufactured by

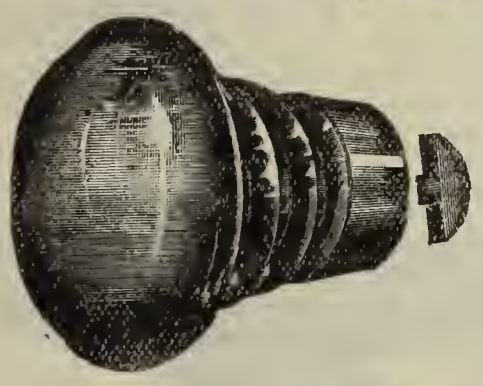
The F. B. Fox Register Mfg. Co.,

CLEVELAND, OHIO.



ALASKA

MADE UNDER THE CAITLEY PATENTS.



STOVE KNOBS AND

HANDLES, TOWEL RODS,

KETTLE BAILS

ALWAYS COLD.

POKERS, LID LIFTERS, SHOVELS, FIRE SETS.

Are good sellers. Send for prices to Hardware Jobber.

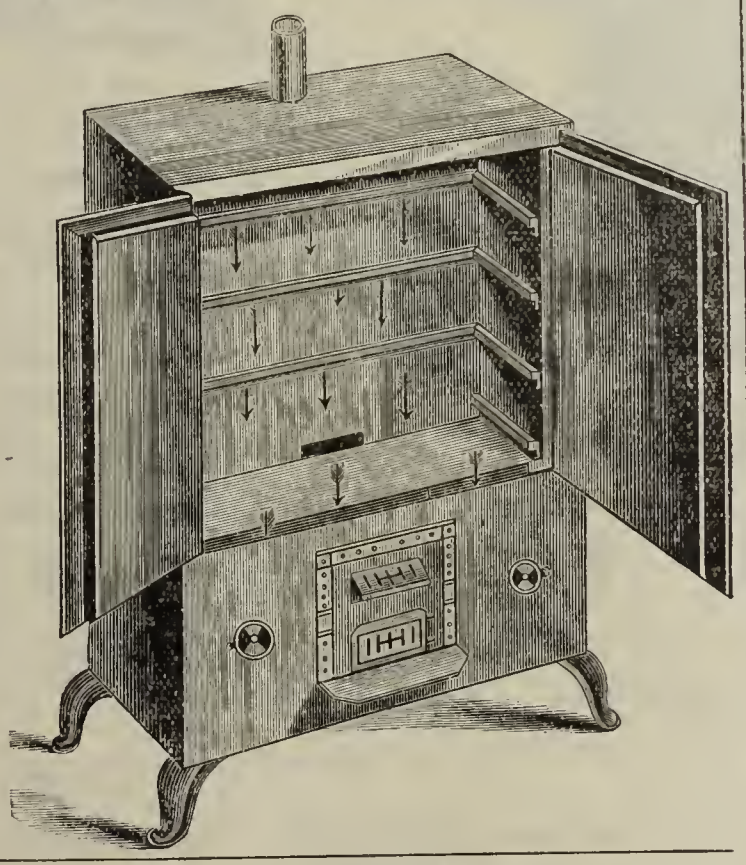
MADE ONLY BY

Troy Nickel Works Troy, N. Y.

Blodgett's Patent Portable Oven

UNEXCELLED FOR

Hotels,
Steamships,
Confectioners,
Japanning,
Core Baking,
Public Institutions,
&c.



The Only Oven

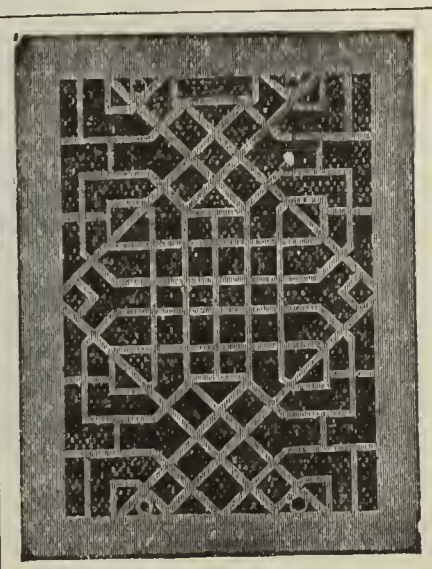
BAKING BY

Perfect Circulation of Hot Air.

Made in ten sizes. Send for Catalogue.

THE G. S. BLODGETT CO., MFRS.,

Burlington, Vermont.



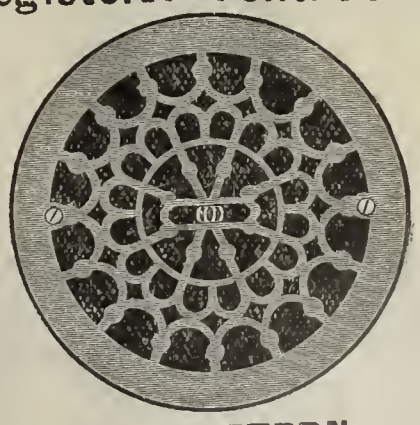
Warm-Air Registers, Ventilators, Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, Buffalo, N. Y.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers. Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.



THE

Scollay Hot Water Heater

For Warming Dwellings, Stores, Offices, Churches, Public Buildings, &c.

Also Boilers specially constructed for Greenhouses, Conservatories, Baths, Laundries, &c.

SEND FOR ILLUSTRATED CATALOGUE AND PRICE-LIST.

JOHN A. SCOLLAY,

72, 74 & 76 Myrtle Ave., BROOKLYN, N. Y.

— "ARE you fond of orchids, Mrs. Flyhi?"

Mrs. Flyhi: "Well, I'm rather plain in my tastes, and don't care for any fancy dishes much."—*Chicago Inter-Ocean.*



No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8⅛ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

Dealers who Handle B. & B. STOVES

Make Money at Both Ends.

There are no old relics or fossils in the B. & B. line.

B. & B. STOVES ARE ALWAYS AHEAD.

Our competitors try to imitate, but the race is too rapid for them.

THE GLAZIER STOVE COMPANY. TRADE MARK B&B OIL & GAS STOVES BRIGHTEST AND BEST. CHELSEA MICH.



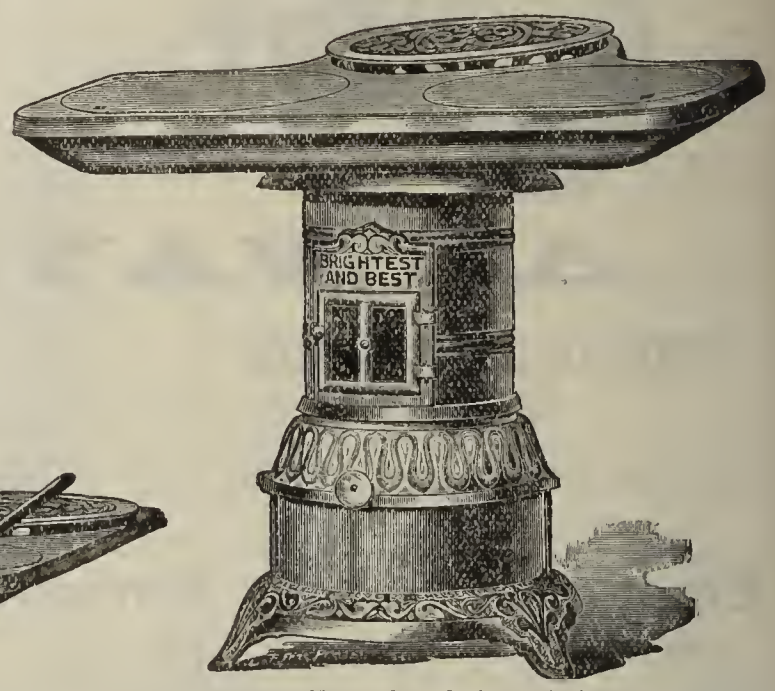
No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozeu in box. Weight, 85 pounds. Height, 8½ inches. Size of Tank, 5½x5¾. NICKEL FRONT. Two 4-inch wicks.



No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozen. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8½ inches. Size of Tank, 5½ x 8½ inches. NICKEL FRONT. Three 4-inch wicks.



No. 6–3 B. & B. Cook Stove.

Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.

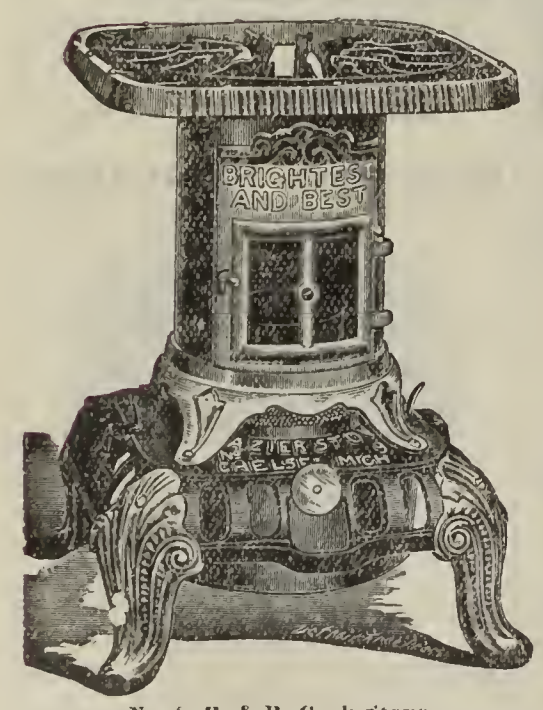


No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**



No. 8 B. & B. Cook Stove.

Nickel Finish. List Price, $6.50. 7½ inch double thick circular wick.

It will pay you to consider these points.

We Are After Your Trade.

You will always find the B. & B. Stoves up to date in every particular.

You cannot spend a little time more profitably than in looking over our 80-page catalogue. Ask for one, with discounts.

Simmons Hardware Co., St. Louis, General Southwestern Agents.
Hibbard, Spencer, Bartlett & Co., Chicago, " Northwestern "
W. W. Montague & Co., San Francisco, " Pacific Coast "
Prescott Brothers, Boston, " New England "
Bindley Hardware Co., Pittsburgh, " Eastern "

THE GLAZIER STOVE CO., Manufacturers, CHELSEA, MICH.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, May 12, 1894.

DAVID WILLIAMS, - PUBLISHER

BUSINESS OFFICES:

NEW YORK.....96-102 Reade Street.
PHILADELPHIA.....220 South Fourth Street.
BOSTON.....146 Franklin Street.
PITTSBURGH..... Room 509 Hamilton Building.
CHICAGO.....59 Dearborn Street, cor. Randolph.
CINCINNATI.....Rooms 22-24 Pickering Building.
ST. LOUIS.....Bank of Commerce Building.
CLEVELAND.....312 The Cuyahoga.

BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Natural Gas Consumption.

The annual report of Special Agent Joseph D. Weeks of the United States Geological Survey for the year 1893 discloses the fact of the growing confinement of the consumption of natural gas to domestic use. The only State in which the use of natural gas for manufacturing purposes increased last year is Indiana. This State contains by far the most important gas field, its estimated area of productive gas territory being about 2500 square miles. Moreover, while the supply falls far below the demand in other gas fields, it is stated to be well maintained in Indiana, and supplies are even obtained from thence by factories in other gas territories. The value of the product consumed in Indiana in 1893 was $5,718,000, against $4,716,000 in 1892. The total value of natural gas consumed in all parts of the country last year was $14,346,250, as compared with $14,800,714 in 1892. This decrease is attributed to the higher prices charged for the gas in 1893. The falling off in value of the gas consumed has been steady since 1888—the banner year—when $22,629,875 worth of the fuel was used. Of this output Pennsylvania alone produced the value of $19,282,375. Last year the output of that State had sunk to $6,488,000, and all the other States, except Indiana, showed a like decline.

The Spread of Sanitary Legislation.

The wave of sanitary legislation that is sweeping over the United States is a most encouraging and excellent sign of the times. A few years ago it would not have been thought possible that so many cities would so soon have adopted measures regulating the plumbing and sanitation of houses. Of course, there have been rules governing this work in the principal cities for some years past, and it is not to the spread of such laws among the cities of the first magnitude that we allude. It is the permeation of the spirit of sanitary reform into the small cities and towns throughout the entire country that awakens surprise and admiration. In fact, so general has been the adoption of laws of this sort that it has been almost impossible to keep track of the places that have followed in this line of reform. It is natural to ask the cause of this sanitary revolution which has been so wide sweeping, and we think it will be generally admitted that the body largely responsible for the good work is the Master Plumbers' Association of the United States, acting upon legislators through the various local associations. For this work they cannot be too highly praised; and it is evident that, with the still further spread of the organization among smaller towns and remoter parts of the country, there will be a corresponding spread of sanitary legislation that will conduce to the health, happiness and material welfare of all people. If the Master Plumbers' Association should come to an end to-morrow it would not have existed in vain, for the impetus that has been given to reform along this line would be felt for years to come. The association, however, is too robust and great a body to fear any sudden death; and we believe that with its growing strength it will increase in usefulness in this as well as in other work.

Sensible Stove Manufacturers.

The stove manufacturers conduct their business very differently from their colleagues in other branches of the iron trade. While prices generally have been not merely reduced but savagely cut until not a semblance of profit can be detected in most staple articles of iron and steel, the manufacturers of stoves have refused to be stampeded and have maintained their schedules. They have seen the demand for their goods shrink steadily 10, 20 and even 30 or more per cent. below their customary volume of business, but have not sought to stimulate the drooping trade by offering stoves at lower and lower prices. In recent years margins of profit have been very slight, owing to increasing competition, and it would have been supposed that the competition for business would be more severe than ever when trade fell off. Yet this was not the case. Conservatism and philosophy ruled in the councils of the stovemen instead of blind frenzy and a rash desire to keep selling. When they found their warehouses getting uncomfortably full of stoves which could not be sold they shut down their foundries and waited for trade to improve. From time to time, as their stocks were drawn upon by the requirements of the trade, they resumed work in the foundries.

Wages Maintained.

Thus has the stove business gone forward, not by any means to the satisfaction of the makers, but with far less friction than in many other lines. Workmen employed in the foundries have not struck because they had no incentive to strike, as their wages were not reduced nor has a reduction been even threatened. Stocks of stoves in dealers' hands have suffered no depreciation in value through the action of the manufacturers, which can hardly be said of any other goods carried by them. The fact seems to have been universally recognized that stoves are cheap enough and sold at figures sufficiently close, so that reductions in price if made would not have enlarged the consumption. It is doubtful if a single consumer who needed a stove during this panicky period made an argument for a lower price based on the decline in other goods. In fact, the reductions in prices on such goods have not been made to any extent in compliance with the views of consumers, but have almost wholly been brought about by the action of the manufacturers themselves. The stove manufacturers propose to continue this policy. At their recent convention in Chicago they passed a resolution that in view of the decreased demand for stoves and the maintenance of the old scale of wages paid their workmen, which had materially enhanced the cost of production, making the selling price so nearly approach the cost, a rigid adherence was obviously required to existing prices and terms, and that it was the sense of the convention that such prices and terms should be firmly maintained during the year 1894. The manufacturers are undoubtedly of the opinion that the depression in business is only temporary, and they seek to prevent a demoralization in their trade and disaffection among their workmen which might not only lead to serious consequences now, but be felt injuriously for some time after the depression passes away.

Prices Maintained.

It is worthy of note in this connection that the stove manufacturers have been able to maintain their prices without the formation of a trust or a combination, or even the semblance of one. They have two national associations, one for defense in case of labor troubles and the other for the mutual interchange of ideas on subjects connected with their business as manufacturers. Neither of these, however, regulates prices. And yet, with no machinery whatever in operation to bolster up one another, they maintain their rates against adverse circumstances which have wrecked combinations of almost every kind. They are a shining example for other manufacturers who have steadily parted with every advantage given them in reducing costs, as if they were in business only for the benefit of the dealer and the consumer.

THE LETTER BOX.

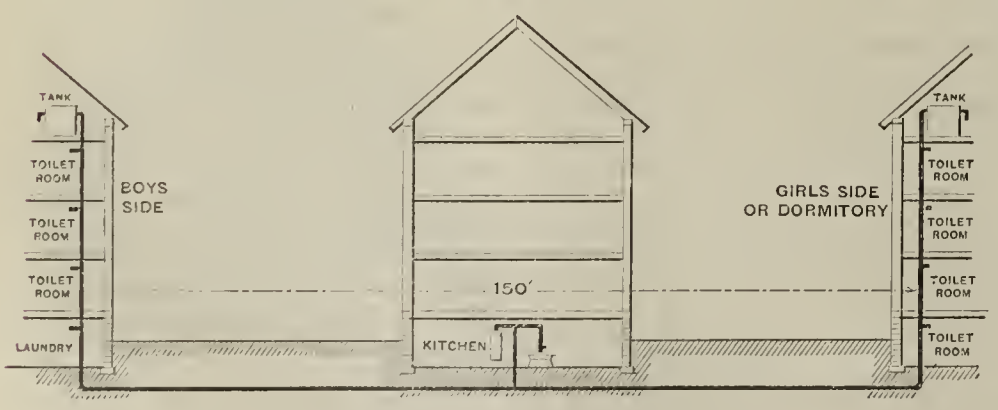
Expanding Liquid.

From C. W., *Winnipeg, Man.*—Will *The Metal Worker* or some of its readers inform me of a liquid that will not harm metals which will contract considerably between 34° and 32° above zero?

Answer.—Our correspondent is probably familiar with the peculiar properties of water, whose point of maximum density is about 39° F. From there to the point of freezing, as the temperature falls, the liquid expands. Water, however, is the only fluid that has a point of maximum density higher than the freezing point. The liquid most suitable to our correspondent's needs is, we think, alcohol, which is one of the most expandible of common fluids. Between 32° and 212° F. its volume increases about one-ninth; under the same conditions mercury expands one-sixty-fifth of its volume. Nitric acid has the same percentage of increase as alcohol, namely, one ninth, but, of course, it would be inapplicable to our correspondent's use, on account of its corrosive effect on metals. Our correspondent will realize that if he wishes to make the fluid visible it is easy to color it.

Erratic Water Supply.

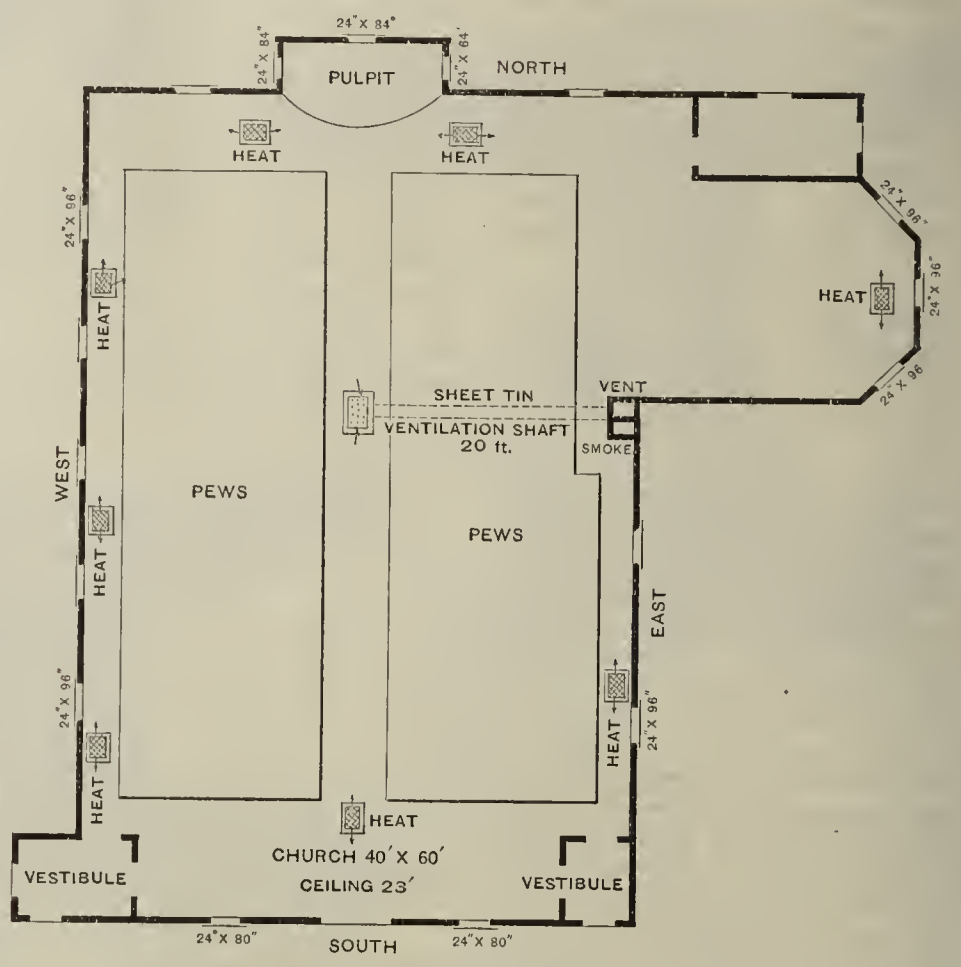
From G. E. S., *East Stroudsburg, Pa.*—I have frequently noticed the trouble that is reported with the flow of water through pipe in different parts of the country, and I now have a mystery on hand which I cannot explain. The sketch shows two different buildings which are supplied with water from the street main. There is a 1000-gallon tank in the upper part of each of the buildings, which are 150 feet apart and connected with a 2-inch supply pipe to which is attached a float valve. When the supply to the tank in the boys' dormitory is closed we have no trouble to draw all the water needed in the laundry and all the toilet rooms, but when the water is closed off in the dormitory on the girls' side there is trouble to get a flow of water in the tank on the boys' side, the supply barely reaching the third story. There is much more water used in the laundry than in any of the other buildings. This experience shows that the water flows much more easily to one dormitory than it does to the other, yet when the school was first opened it worked equally well on either side. I should like to have the readers express their opinion as to what makes the trouble.



Erratic Water Supply.

Wants a Better System.

From W. S. G., *Penbrook, Pa*—I send herewith the drawings for a church that is to be built in this town. The church in question is 40 x 60 feet with ceiling 23 feet high, built of brick and stone with all sides exposed and on a slight elevation of ground facing south. The architect has made a few marks relative to location of registers, &c., on the floor plan as a guide for the heating engineer of what he calls a practical system of ventilation. His theory is that the hot air will rise at the outer edge of the room and concentrate at the ventilating register, which is in the center of the room, drive out the cold and stagnant air through the vent shaft, which is almost as cold as icy Greenland, and furthermore the draft of the shaft will also assist in carrying off the cold air. The furnaces take the fresh air from the cellar, which is a grand feature, as church cellars, generally speaking, are in a haphazard condition, containing an accumulation of ashes and other refuse which laden the air with impurities which are taken into the furnace, thence into the church room and into the lungs of the occupants, causing more or less distress. If the furnaces, are put in according to this plan the result would be a warm ceiling and a cold floor, with a large percentage of loss of heat through friction and radiation in the cellar. There would be no circulation of air which is essential to perfect heating. Another barrier to the perfect operation of the furnaces is the chimney, which is lower than the ridge of the roof, causing rebounding currents of air to take place at intervals, a detriment to the working of the furnace. My plan would be to pour the heat into the room in an



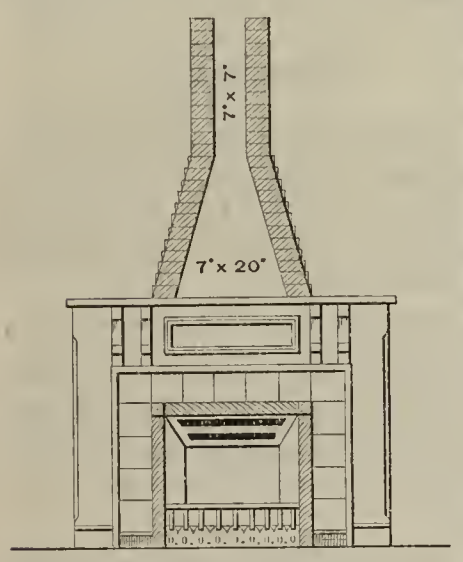
Wants a Better System.

undivided volume, and so maintain its power and quicken the ascent to the room above with less loss of heat through friction and radiation. Now I want some of the practical readers of *The Metal Worker* to give me a plan to heat this church in a satisfactory manner under existing circumstances by hot air without respect to the architect's or my opinion.

Note.—We hope this correspondent will not be disappointed in his appeal for assistance. It would seem that as the ventilating shaft is warmed on one side by the smoke flue there would be a tendency for upward currents in it. Many churches are heated with air taken from the cellar, but it has been suggested that an arrangement for taking the air from either the church or out of doors at will has advantages. Some authorities agree with our correspondent that it is better to have one large register over the furnace than to have several scattered registers. Here is an opportunity for giving a rule for determining the size of register, ventilating shaft and air supply, as well as suggesting a method of heating.

Fire Place Smokes.

From J. A. S., *Fairfield, Iowa.*—I was much interested in the article on the proportion of fire places in *The Metal Worker* of April 7. It is a fact that half of the grates in this town smoke, and some of them that have the smallest flues work the best, so that I think it is not so much the size of the flue as the way the grate is connected to the flue and the shape of the flue at the grate connection that causes the trouble. The question is, How ought the grate to be connected with the flue and what should be the size of the opening that leads to the flue to make a good draft for soft coal or wood? For an ordinary sized fire place which has a front opening 24 x 30 or 30 x 30 inches, what is the best proportion or



Fire Place Smokes.—Fig. 1.—*Front View Showing Flue.*

shape for the opening to the flue? Should the opening be over the front or the back part of the grate? I inclose a drawing of a grate that is located in the corner of a room which has about 1 foot of space between the back of the grate and the flue. Fig. 1 shows a front view of the grate and the shape of the fluc over it. Fig. 2 shows a sectional view of the grate and the opening space behind the grate. This grate smokes when burning either wood or coal, and I would be under obligations to some reader of *The Metal Worker*

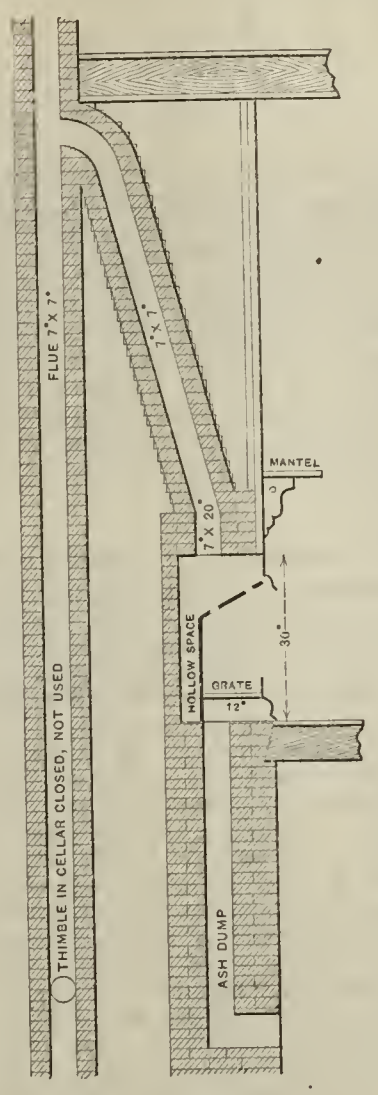


Fig. 2.—*Sectional View.*

who can suggest a way to make it work well without smoking. As will be seen by the sketches, the smoke flue is 7 x 7, and at the top of the grate it is 7 x 20 and gradually tapers into the flue above.

Machine or Tool?

From M. J. C., *Elwood. Ind.*—Will the readers of *The Metal Worker* please state whether a lathe should be classed under the head of tool or machine in the stock account of a foundry and machine shop? The question has been raised in our office, and some think that the lathe should be considered under the head of a tool, claiming that it is a machine tool, and for that reason should be called a tool.

Note.—As this question is an interesting one, we hope to receive reports of the custom observed in different offices on the classification of this fixture in their plants.

How He Uses His Paper.

From C. E. S., *Clinton, Iowa.*—I have read *The Metal Worker* with great interest for a number of years, and as the copies do not come fast enough I frequently read much of the valuable matter they contain a second time, particularly during the winter months. As a result of my reading I have devised the following method of preserving them. I separate the advertising pages from the reading matter and bind six months of the reading matter together, as a larger volume is inconvenient to handle, and in this way it is ready for reference. I then sort the advertisements, preserving one of every advertisement that has appeared, and bind this as a separate volume, which makes a most excellent buying directory. I would advise others to follow this plan, as they will find it very useful, and they can readily do it themselves. To me the Letter Box is a very interesting feature, and I use it as a sort of civil service examination, reading every question and preparing a satisfactory answer, at least to myself, and whenever I am unable to answer a question I make it a point to seek for the information until I find it.

Centennial Flat Iron Heater.

From W. H. Hess, *Lanark, Ill.*—Will some reader of *The Metal Worker* furnish me the address of the manufacturers or sales agent of the "Centennial Flat Iron Heater," a round heater made to set in a single lid opening of an ordinary cook stove? The heater has a pair of sliding covers that close automatically when the iron is placed in the heater. No manufacturer's name appears on the heater, but it is marked "Patent Allowed 1876." I am anxious to obtain this information and will be much indebted to any one who can furnish it.

The World's Fair Buildings.

The Columbian Exposition Salvage Company, with a capital of $200,000, have purchased the 20 World's Fair buildings, which are all the buildings that the Park Commissioners had in their possession, with exception of La Rabida Convent and the Forestry Building, for the sum of $80,000. This gives them a working capital of $120,000 after paying for the buildings. The company consist of the following scrap iron and scrap metal merchants: August Pollak, North Western Iron & Metal Company of Chicago, Ill., A. S. Deutsch & Co., of Chicago and Cleveland, and Ohio Iron & Metal Company of Cleveland, Ohio, and the Chicago House Wrecking Company of Chicago, and Sievers & Fearnly of Cincinnati, Ohio, who are experts in the business of dismantling houses and buildings and also large dealers in the lumber trade. It is expected that work will begin within a few days. The end of this season will see the White City pretty well dismantled. All the structural material will be taken down very carefully, and the company are prepared to sell to railroad companies, factories and others who contemplate erecting buildings any quantity of such material in the iron and lumber structural line that they desire.

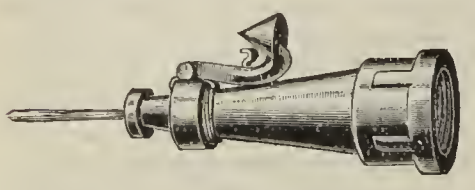
Returns of the mineral production of Canada for the year 1893 have just been issued. They show an aggregate value of $19,250,000, or $250,000 less than that of 1892. Nickel heads the list of metals, the output being 3,992,982 tons, valued at $2,078,351. Gold was produced of the value of $927,244; copper, $875,864, and silver, $321,423. The coal mined was 3,000,700 tons, valued at $8 422,259; iron ore is placed at 124,702 tons, valued at $298,018.

The new wheat crop of the Argentine Republic is said to be an abundant one. It is expected that the surplus available for export will be largely in excess of the exportation last year, which amounted to over 1,000.000 tons. The wool clip is also said to be heavy.

THE RETAIL STORE.

Spray Nozzle.

We show in the accompanying illustrations a spray nozzle made by the Ette & Henger Mfg. Company, St. Louis, Mo. Fig. 1 shows the nozzle throwing a solid stream, while Fig. 2 shows it



Spray Nozzle.—Fig. 1.—View of Nozzle Throwing Solid Stream.

with the spray attachment. One of the special features to which the manufacturers direct attention is that it has no joints or packing to wear out or leak. The spray attachment, which it will be noticed is hinged, and may be thrown forward in front of the stream, will

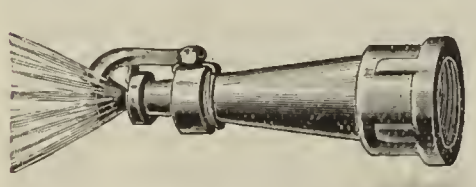


Fig. 2.—View of Nozzle Throwing Spray.

permit of a spray as fine as mist, or will close off the pressure entirely, acting as a cock. The nozzle is made in two sizes, ¾ and 1 inch, both brass and nickel plated.

The Perfection 5-Gallon Can.

Deverall Perfection Mfg. Company, 36-38 Bridge street, Brooklyn, N. Y., are offering 5-gallon oil cans, an illustration of which is given herewith.



The Perfection 5-Gallon Can.

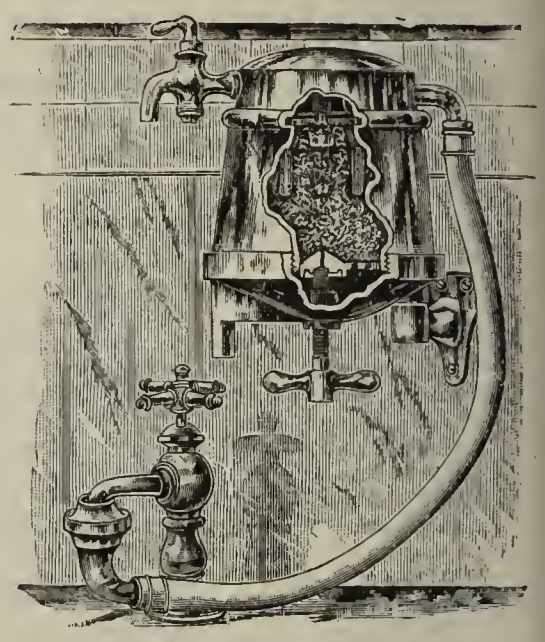
The can is made of No. 28 galvanized iron, with a stamped bottom set up ⅛ inch and a corrugated tin top. The pump is removable for shipping or when sending the can to be refilled, and is made so that the spout may be swung over the top when not in use. The manufacturers claim that the can has a strongly constructed bottom and top to withstand hard usage; that the can may be perfectly sealed for transportation when filled; that the pump thoroughly vents the can, insuring a perfect flow, and that the pump is simple and strong, provided with anti-corrosive valves. It is stated that the can is well constructed and thoroughly soldered.

Pure Water-Pure Food Filter.

The accompanying illustration shows a filter which the Coles Mfg. Company of Philadelphia are putting on the market. In construction it consists of a brass or iron cylinder with a removable bottom having a discharge nozzle. Three perforated tubes are attached to a plate or diaphragm fitting into a recess or roll around the upper part of the cylinder, through which the water is carried to the center of the filtering material. Another perforated plate or diaphragm fits loosely in the lower rim of the cylinder, and is raised or lowered by a T handle screw passing through the removable bottom. A faucet is placed in the upper part of the cylinder in order that unfiltered water may be drawn when required. Water is supplied to the filter by means of a rubber hose connected to a supply nozzle in the head of the filter and attaching to a supply faucet by means of a special coupling containing a rubber washer with a small hole in its center which allows of a tight connection being made with the nozzle of any ordinary compression or basin cock or spigot. The filtering material used is a cotton pulp which is designed to absorb the sediments, impurities, and coloring matter contained in the water passing through it, and allows the water to pass out through the discharge in a steady stream, it is stated, of 25 to 30 gallons capacity per hour in the smallest size of the filter.

Filtered water is discharged from the outlet at the bottom of the filter, at the left hand side, as shown. By turning the supply faucet with which the filter is connected an immediate flow of filtered water is obtained. When the pulp becomes impregnated with foreign matter, it is taken out of the filter, washed in the same manner as a piece of cotton cloth and replaced. In this way the pulp may be used over and over again without renewal. In the smallest size of the filter it is claimed that from 400 to 800 gallons of water may be filtered without cleansing the pulp. The filter is affixed to a wall or wood work by a bracket which enters a socket in the cylinder bottom, and thus allows of easy removal when required. Adjustment of the filter to the water pressure is obtained by raising or lowering the bottom plate by means of the screw until the pulp presents the necessary compactness to secure thorough filtration with a quick supply. The heavier the water pressure the greater the compactness of pulp required.

The filter is made in two sizes. The cut shows the larger size, made of brass, polished and nickel plated, or of tinned cast iron. The smaller size of filter is made entirely of tinned cast iron, for kitchen or common use, without facilities for securing unfiltered water other than by removal of the filter tube. The filter is also made of special form for permanent attachment. The makers claim that the filter embodies the following advantages: Indestructible filtering material capable of being easily and thoroughly cleansed; thorough and rapid filtration, with little diminution in delivery, and adaptability to any pressure.



Pure Water-Pure Food Filter.

MEMORANDA.

THE FIRM of C. Seybold & Son, Jeannette, Pa., have been succeeded by Nesbitt & Bro., who will carry on the business of dealing in stoves, tinware, &c. Messrs. Seybold are going into the lumber business in Randolph County, W. Va.

ZIEGLER & QUEARY AND W. W. PRATHER of Manchester, Ohio, have consolidated and will remove to Portsmouth, Ohio, where they will do business under the style of the Portsmouth Tinware Company as jobbers in tinware, wooden ware, stoves and crockery.

The gold mining industry of Oregon received considerable stimulus last year. It is stated that the gold output for 1893 was nearly $2,000,000, a far larger yield than ever before. Her wheat and woolen interests, however, suffered severely from depression.

The new truck receiving station of the Pennsylvania Railroad, in Jersey City, is of very large dimensions. It is 655 feet long and 92 feet wide. Eighty trucks can unload at once on each side of the platform.

PLUMBING and GAS FITTING.

Plumbers' National Convention.

President Finnerty is sending the following notice to the master plumbers' associations in the different States:

The twelfth annual convention of the National Association of Master Plumbers will convene in Philharmonic Hall, Detroit, Mich., at 10.30 a.m., Tuesday, June 19, 1894, continuing in session for three days. The Cadillac Hotel has been designated as national headquarters. Accommodations can be secured at the above house for from $3 to $4 per day. Accommodations can also be had at the following: Russell House, $2.50 to $3.50; St. Clair Hotel, $2.50 to $3; Normandie Hotel, $2 to $2.50; Wayme Hotel, $2 to $2.50; Barclay Hotel, $2. The above rates are all on the American plan. The houses are all located convenient to Philharmonic Hall, with the first four possessing the advantage in this respect. The Railway Association of Michigan, the Trunk Line Association, the New York & Boston Lines Passenger Committee and the Central Traffic Association have granted excursion rates of a fare and a third on the certificate plan to all delegates and alternates attending the convention, from points within their respective jurisdictions. Each person desiring an excursion rate must purchase a first-class ticket (either limited or unlimited) to Detroit, for which he will pay the regular fare, and upon request the ticket agent will issue a certificate certifying to the purchase of ticket at the regular tariff fare and likewise determining the route via which return ticket will be sold. This certificate must be signed by the ticket agent at the point where the through ticket is purchased, and in the presence of the ticket agent, signed by the purchaser; also, countersigned at the convention by the financial and recording secretary of the National Association of Master Plumbers and vised by the special agent of the railway association.

Tickets for return journey will be furnished on presentation of the above certificates to the ticket agent at Detroit on payment of one-third the regular first-class fare. The return tickets will be furnished only on certificates procured not more than three days before the convention assembles nor later than three days after the convention assembles (June 19), and will be available for continuous passage only, no stop over privileges being allowed on tickets sold at less than regular unlimited fares. The certificates will not be honored unless presented within three days after the adjournment of the convention, Sunday not being reckoned as a day. Certificates are not transferable. No refund of fare can be expected because of failure of parties to obtain certificates and have them properly filled out.

It is to be regretted that the Western Passenger Association has declined to grant a rate of a fare and one-third on the certificate plan; therefore delegates north of the north line of Cook County, Ill, and west of the west line of said county and the Illinois and Mississippi rivers, not including Burlington, Keokuk, Quincy, Hannibal and St. Louis, which cities are in the territory of the Central Traffic Association, will have to pay the regular fare to and from the said cities, but from there they can purchase tickets on the certificate plan as herein described. Delegates from the South outside of the Central Traffic and Trunk Line associations will have to pursue a similar course.

Boston Plumbers and the National Convention.

By addressing National President Daniel G. Finnerty, at 378 Boylston street, Boston, Mass., at an early date arrangements can be made by plumbers along the route to Detroit for joining the Boston delegation. Mr. Finnerty has sent the following to the association in New England, New York, New Jersey and Delaware:

The delegates from Boston and vicinity will leave Boston at 2 o'clock Saturday afternoon, June 16, via Boston & Albany Railroad and New York Central & Hudson River Railroad, arriving in Buffalo at 4 o'clock Sunday morning, and from there proceed to Niagara Falls, where the special train will be side tracked until Sunday noon, thus giving the delegates an excellent opportunity to view the falls. The train will leave Niagara Falls about Sunday noon via Michigan Central Railroad, arriving in Detroit about 9 o'clock Sunday evening. It is hoped that the delegates from the New England States and New York and those who can join the party along the route will do so and stop over with them at Niagara Falls. In order that ample provision may be made for all, it is earnestly requested that those intending to join the Boston delegation and stop over with them at the falls will give notice of their intention as early as possible of the number and where they will join the delegation. The following is a schedule of the train's time at places where delegates can join the delegation:

JUNE 16, 1894.

Train leaves Boston 2.00 p.m.
Train leaves Worcester 3.12 p.m.
Train leaves Palmer 4.17 p.m.
Train leaves Springfield 4.44 p.m.
Train leaves Westfield 5.01 p.m.
Train leaves Pittsfield 6.32 p.m.
Train leaves Chatham 7.16 p.m.
Train leaves Albany 8.10 p.m.
Train leaves Utica 10.35 p.m.
Train leaves Syracuse 12.00 midnight.
Train leaves Rochester 2.10 a.m.
Arrive in Buffalo 4.00 a.m.

The above table is liable to a slight change before June 16. Should such change be made, further notice will be received from this office, or can be had on application to local ticket agents.

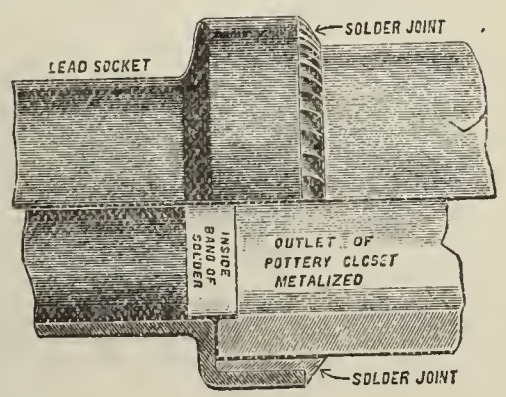
THE ATTENTION of passers by was attracted to the shop of George Franklin, 142 Centre street, New York, last Monday by some quarter bends made of 8-inch pipe from sections 12 feet long. These pipes were for use in a water works system to overcome the friction that would result from the use of the ordinary ells. The bends were very true and smoothly made.

New York Delegates.

Master Plumbers' Association of New York City have elected the following delegates to attend the national convention of the Master Plumbers to be held in Detroit next month: Col. Geo. D. Scott, John Byrns, John Mitchell, H. G. Gabay, H. J. Pattison, Chas Schloesser, Jas. G. Collins, Thos. J. Tuomey, W. M. Young, John Yule, John C. Starck, Wm. Montgomery, M. J. McDermott, E. J. Brady, Jas. Gillroy, Saml. Malcolm, Michael Regan, John McCarren, Jos. W. O'Brien, Frank Reynolds, Timothy Sullivan, Thos. Martin, E. P. Mahoney, Philip Smith, Jas. R. Corbett, Alex. Cameron, Wm. McDermott, Thos. J. Cummings, Adam Huston, Jas. M. Martin, C. Fraser, P. J. Carpenter, J. O. Shumway, Chas. A. Walsh, J. A. Rossman, J. E. Toumey.

Soldering Metal to Pottery.

A new method of connecting lead with porcelain is shown in the engraving below, which is reproduced from



Soldering Metal to Pottery.

London *Engineering*. It has been patented by Doulton & Co., 75a Queen Victoria street, London, E. C. The object of the invention is to get a permanent and tight joint between soil pipes and earthenware plumbing fixtures. The fixtures are made and glazed in the usual way, and the part which is to be connected with the lead pipe is painted over with a metallic solution and then fired. A thin film of metal is thus formed on the surface of the porcelain, and to this the lead pipe can be soldered. It is claimed that the union is perfect; that the lead cannot be removed without tearing the glazed surface of the earthenware, and that the joint is not only air tight, but will resist a strain far greater than it could ever encounter in ordinary usage. The manufacturers state that one was connected with an air pump and tested to 250 pounds on the square inch, a pressure which it sustained perfectly. It is probable, says *Engineering*, that this method of attaching a metal pipe to earthenware will be used for many other purposes besides that for which it has now been introduced, but even should this not be the case, the invention is a very useful one, and will probably supersede red lead and other joints when connecting lead pipes with earthenware.

Massachusetts Master Plumbers.

The Convention of the Massachusetts State Association of Master Plumbers met at Holyoke last Tuesday, nearly 100 delegates attending. A dinner was enjoyed at which Mayor Whitcomb and others were guests. The officers elected for the ensuing year are:

President, W. H. Mitchell, Boston.

Vice-president, J. W. Green, Worcester.

Recording secretary, Daniel Shannon, Boston.

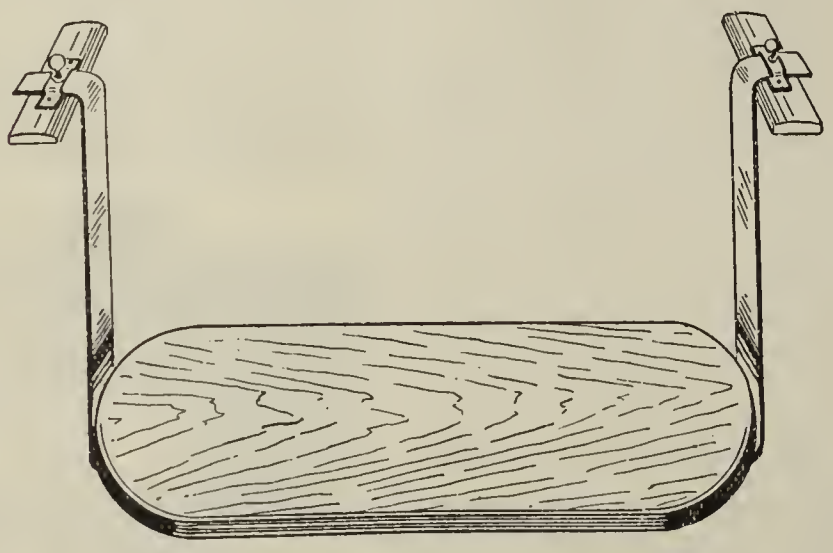
Financial secretary, C. P. Lyman, Holyoke.

Treasurer, E. D. Casey, Holyoke.

Executive committee, J. W. French, Boston; T. J. Clifford, New Bedford; R. E. Fogwell, Fall River; J. F. Davelin, Somerville; O. S. Kendall, Worcester.

Adjustable Bathtub Seat.

St. Louis Bronze & Aluminum Works, 3741–3743 North Broadway, St. Louis, Mo., are offering an adjustable bathtub seat, as shown herewith.



Adjustable Bathtub Seat.

The hanging bar upon which the seat rests is made of polished steel, nickel plated, the clamps are of cast brass, nickel plated, and the seat and bearings of oil finished ash, the bottom of the bearings being covered with rubber so as not to deface the bathtub molding. The seats are also made with the metal work enameled, instead of being finished as described. Other styles are made to order with adjustments on the sides to raise or lower the seat, with a tilting seat board made of any kind of wood desired, or of aluminum or rubber. The seats are designed to fit any style of bathtub and for all kinds of bathing. They are referred to as convenient for foot baths, hip, vapor or sitting baths, and as especially adapted to the use of invalids.

TRAPS AND VENTS.

D. R. Brownlow, plumber, of Middletown, Conn., is placing on the market a new lamp and gas stove with curling iron heater attachment. The stove, we understand, is meeting with an excellent demand from the trade.

"Clean Sweep Non-Syphon Sewer Gas Trap" is the title of a catalogue issued by the Detroit Sanitary Supply Company, Detroit, Mich., sole manufacturers of these devices. The catalogue is addressed to architects, plumbers and all interested in sanitary plumbing, and has been gotten up in a neat and tasteful manner. The Clean Sweep traps are illustrated in all sorts of forms as adapted to lavatories, &c, different forms of traps being illustrated both separately and in connection with fixtures. Brass and lead traps are both shown, and several pages are given to bath wastes and overflows. Basins are shown, and at the close are illustrations of basin plugs. In connection with the illustrations are full price-lists and, where necessary, brief descriptions.

L. M. Barnes of Burlington, Conn., has bought out the plumbing business of the Cowles-Couch Company of Church street, New Britain, Conn. Mr. Barnes is a graduate of the New York Trade School, and has worked several years in Cleveland, Ohio.

The Park & McKay Company, Detroit, Mich., issue a handsome catalogue of the Utopia high grade syphon water closets. The pamphlet, of large size, contains illustrations of the Utopia closets in various finishes and combinations. Altogether, some 24 large pictures of the closet are shown. Full particulars of the finishes and prices of the different combinations are given in connection with the illustrations, while an introductory portion gives a description of the closet, and sectional views show its constructive features and operation.

The annual meeting of the stockholders of the Vanderman Plumbing & Heating Company was held in the office at Willimantic, Conn., on May 2, at which the following directors were chosen: William Vanderman, A. T. Fowler, Dennis Shea, John Riley, E. L. Vanderman. The directors selected A. T. Fowler president, Dennis Shea vice-president, John Riley secretary, Wm. Vanderman treasurer and manager. A 6 per cent. dividend was declared on the capital stock from the earnings of the company during the past year. The amount of business done this year showed a large increase over the preceding year.

The Kelly & Jones Company, Greensburg, Pa., are sending out a circular entitled "Speaking of Air Cocks," showing a weather cock on a building and the air immediately around it filled with air cocks and pet cocks of their manufacture which are provided with wings. On the inner pages, with the statement "Here are a few larger birds of the same feather," they show a variety of the cocks they make. They also make a specialty of recessed fittings for wrought iron drainage systems and issue a small circular showing the different styles of fittings they make, with prices.

The plumbers of San Antonio, Texas, complain because the sanitary regulations of that city are not enforced.

John Bragg, Shelbina, Mo., has bought the business of the Boyd Plumbing Company, at Quincy, Ill., and is now in full charge.

Henry Hauk and Anton Metz have bought out the plumbing business of Edwin C. Mason, at Madison, Wis.

Steadman & Co. have bought the plumbing business of J. W. Skelly & Son, at Bristol, Conn.

John Cremin has been chosen delegate from Pawtucket, R. I., to the national convention of the Master Plumbers' Association of the United States, which occurs next month in Detroit, Mich.

The special brass work required in many of the new and large buildings which have been in course of completion during the past winter has brought many orders for special plumbing fixtures to James Conity, 256 Pearl street, New York.

W. H. Poole has bought out the plumbing business of W. A. Pierce & Co., 126 Main street, Charlestown, Mass.

Secretary J. A. Barr of the Master Plumbers' Association of Rochester, N. Y., informs us that the following delegates to the national convention of the master plumbers to be held at Detroit next month were elected at a recent meeting: J. A. Creelman, J. A. Barr and J. Mahar. Alternates: Thomas Connolly, H. Hart and George Dodds. President W. G. Reed will also attend.

George H. Murphy, 31 Hamilton street, Bound Brook, N. J., is circulating in his locality a circular entitled "That New House," calling special attention to the Auburn steam boiler and explaining that a modern house is not fully equipped without a bathroom and a good plumbing system, and that the house is not habitable unless it has a water tight roof.

The Centre street store of the Colwell Lead Company of New York City, dealers in plumbers' supplies, has been recently improved and adorned by the remodeling of the street front. Large plate glass windows have been inserted and the whole exterior of the well-known establishment at No. 63 has had imparted to it a bright and attractive appearance.

A pleasant letter from J. H. Donnelly of Ware, Mass., states that he is still engaged in business in that city, and that the volume of trade has so increased that he has found it necessary to take larger quarters, at 71 Main street. Through some error, the impression has gone abroad in the trade that he has removed and his mail is being sent to other cities, causing him no end of annoyance.

The Miller Iron Company, Providence, R. I., are sending to the trade a circular relating to cast iron tanks made in two sizes—24 x 72 and 24 inches deep and 24 x 60 and 24 inches deep. They are made with an outlet for connecting either iron or lead pipes

and can be furnished with or without an overflow. The company also make a special style of tank legs in various lengths which are arranged to be braced by a rod running the entire length of the tank and secured with lock nuts each side of the leg. The legs are drilled so as to fasten to the floor and are fastened to the tank by tap bolts, lugs being cast on the bottom for this purpose.

THROUGH the kindness of J. B. Sawyer of the Board of Health of Manchester, N. H., we have received a pamphlet with the regulations for the plumbing and drainage of buildings in that city. These regulations are of the modern character and went into effect May 1.

MCELROY & Co. have opened a plumbing and gas fitting establishment at 516 Santa Fé avenue, Pueblo, Col., where they are doing a nice business.

INSPECTOR OF PLUMBING R. S. BEMIS, Providence, R. I., has recently appointed Horace B. Holland as assistant inspector. Mr. Holland has been in the employ of Thomas Phillips & Co. for 20 years, and is highly recommended as a first-class man for the position.

BENJAMIN F. SHAW, Wilmington, Del., has the contract for the plumbing work on the new street railway of the Metropolitan Electrical Company in Reading, Pa.

GEORGE GRUSSING, architect, Chicago, has prepared plans for a residence to be erected at Watertown, N. Y., for Mills Kilby, to cost about $20,000, to be provided with the best of modern plumbing, hot water heating and electric light.

P. D. ARMOUR & Co., Chicago, will erect a large market and barn at 1136 West Madison street. It will be provided with plumbing fixtures and stable fittings.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

AMONG other plumbing contracts secured by G. M. Sinclair, Hoboken, N. J., may be mentioned one for $5000 for the Mayor of that city, and another amounting to $3000 for William Winges of the same place.

ISAAC COFFIN & Co. of Boston, Mass., are placing a No. 210 Richmond hot water heater in the dwelling owned by Rev. Amos Harris, Everett, Mass.

THE RESIDENCE of Francis Jewett, Lowell, Mass., will have a heating plant installed by the H. R. Barker Mfg. Company of Lowell, Mass., who will use a No. 33 Richmond Victor steam heater.

JOHN F. MULVEY has the contract for heating the private residence of Mrs. Susan H. Cook of Woonsocket, R I., and will use a No. 44 Victor steam heater.

ARCHITECTS W. W. BOYINGTON & Co., Chicago, have prepared plans for a three-story flat building to be erected on Flourney street.

ARCHITECT L. G. HALLBERG, Chicago, has plans for a store and apartment house to be erected on the corner of Clark street and Belmont avenue.

JOHN A. SCOLLAY, 74 Myrtle avenue, Brooklyn, N. Y., has taken the contracts for the heating apparatus for the swimming baths of the Twenty-sixth Ward Branch of the Brooklyn Y. M. C. A.; the large apartment house of N. Lucken, Brooklyn; the large boarding and livery stables of E. E. Wheeler, Brooklyn; a range of greenhouses for H. Fischer, Great Neck, L. I; four greenhouses for Geo. Kruse, Jersey City; a range of violet houses for A. McKellar, Rockland Park, N. Y.; the private conservatory of the Hon. Theo. Koeler, Long Island City, and also three large steam boilers for the Ogden apartment houses, Brooklyn.

C. S. BARKER will build an apartment house to cost $50,000 at Superior, Wis., which will be heated by steam and have a plumbing system.

THE NEW BOARD OF SUPERVISORS of Warren County, Ill., have appropriated $35,000 for heating, lighting and furnishing the new court house.

CROOK, HORNER & Co. of Baltimore have been awarded the contract for supplying the heating and ventilating apparatus for the United States Post Office building at Staunton, Va., on the firm's bid of $2591.

JAMES H. MACK, Fitchburg, Mass., has been awarded the contract for plumbing the new High School building at that place. The plans call for 81 water closets, 30 lavatories, 8 drinking fountains, 30 urinals, and hydrants on each floor for fire purposes; all piping exposed to be brass, nickel plated.

SEALED PROPOSALS will be received at the office of the custodian of the United States Marine Hospital, New Orleans, La., until May 28, for furnishing a new water supply to the hospital.

THOMAS & RAPP have been engaged to prepare plans for the reconstruction of a school building, recently destroyed by fire, at South Evanston, Ill., for the Board of Education. It will be three stories high, with exterior of buff pressed brick and Bedford stone, and will be heated by steam.

S. S. BEMAN is letting contracts for two school buildings, at Pullman, Ill., for the Pullman Palace Car Company. They will be of various dimensions—one three stories high, built of pressed brick and stone, have slate roofs, hard wood finish, steam heat, gas fixtures and the latest improvements, at a total cost of $80,000.

M. J. DALY, Waterbury, Conn., has been awarded the contract for heating and plumbing the Apothecaries' Hall Company's block. Each room is to be heated and fitted for gas and electric lights, hot and cold water.

BIDS will be received by the authorities of the Western Female High School building, at Baltimore, Md., up to May 16, for two methods of heating and plumbing. Separate bids will be received for a steam plant and a hot air plant, and for a dry closet system and a plumbing system, using water closets, &c.

THE JOHN DAVIS COMPANY, 69 to 79 Michigan street, Chicago, are to install a hot water heating plant in the flat building of Giles Hubbard, Indiana avenue and Forty-fourth street.

A. C. HICKEY, 69 South Clinton street, Chicago, has the contract for plumbing, sewerage and gas fitting in the double flat building of Henry Horne & Co., 169 and 171 South Morgan street.

AMONG the contracts recently taken for plumbing, gas fitting and sewerage by E. Baggot, 169 and 171 Adams street, Chicago, can be mentioned the following: Residence of C. J. Blair, Drexel Boulevard and Fiftieth street; factory of Phelps, Dodge & Palmer Company, Twenty-sixth street and Shields avenue; residence of D. B. Jones, Lake Forest, Ill.

CHARLES A. KLIE of Columbus, Ohio, has the contract for the plumbing work and drainage to be done in the new court house to be erected at Toledo, Ohio.

BROOMELL, SCHMIDT & Co., Limited, York, Pa., are using in one of their heating contracts one of the No. 6 hot water boilers made by Thomas Weathered's Sons of New York City.

GEORGE H. MURPHY, Bound Brook, N. J., has just completed the plumbing work in the residence of Mrs. Giles.

GEORGE G. HARGRAVES, Kansas City, Mo., will use a No. 6 hot water boiler made by Thomas Weathered's Sons, New York, for heating a residence in that city.

THE AMERICAN HEATING & CONSTRUCTION COMPANY, 69 Centre street, New York, will install a steam heating plant, using an Economy boiler, in the apartment house of Peter Fuchs, Ninety-fourth street and Madison avenue. They are also running the pipe for the refrigerating plant in the cold storage building of Wills Brothers, 143 Chambers street.

THE BOILERS of the H. B. Smith Company, 133–137 Centre street, New York, will be used for heating the Young Men's Christian Association building at Plainfield, N. J., and the residences of W. T. Campbell, Newark, N. J., and Charles L. Johnson, Ansonia, Conn.

THE SECRETARY of the Treasury has awarded the contract for supplying steam heating and ventilating apparatus for the public building at Danville, Ill., to J. T. Foley & Co. of Evansville, Ind. The contract price is $4790.

SEALED PROPOSALS will be received at the office of the Comptroller, in the Stewart Building, up to May 17 for alterations to the steam heating and ventilation and for the plumbing and gas fitting work in the new Criminal Court House at New York City.

ADDITIONS will be made to School No. 6, Terre Haute, Ind., that will require a heating and ventilation and a plumbing system. The entire work must be completed by August 30.

PROPOSALS will be received up to May 16 for the heating, ventilation, plumbing and gas fitting for a school building in district No. 50, Buffalo, N. Y.

A. F. SPETTEL, La Crosse, Wis., has let the contract for the plumbing work at his studio building to G. J. Egge.

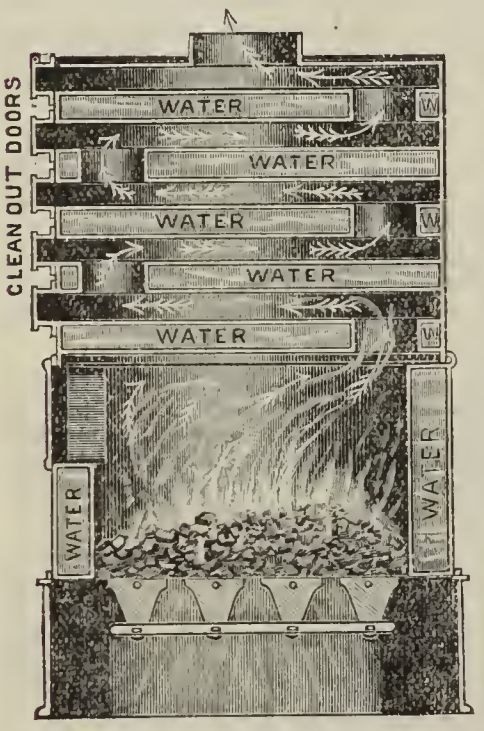
THE entire stock of roofing sheets held by one sheet mill was bought at market prices by a Canton concern, and there is a good demand for all that can be turned out by those mills in operation. The stoppage has become a source of annoyance both to buyers and mill operators, and no relief is expected for at least two weeks to come.

The railway companies have made very large reductions in the staffs of their mechanical departments. This has led to a great decline in the railway demand for heavy metals.

STEAM AND HOT WATER.

The New Lily Hot Water Heater.

Rubel & Co., 75–77 Lake street, Chicago, manufacturers of the Lily line of steel ranges, furnaces, steam and hot water heaters, are introducing the new Lily hot water heater, which is herewith illustrated. The heater is constructed of cast iron, on the circular, sectional principle, by which any section may be readily removed or replaced, and admitting of it being "knocked down" and taken through narrow passages. It is portable, requiring no brick work in setting, and consists of the base, containing the grate frame and grate and forming the ash pit, the fire pot, and from three to five sections placed alternately, and lastly surmounted by the top casting. The grate is self dump-



The New Lily Hot Water Heater.

ing and shaking, anti-clinker, cleanly, the ashes falling into a closed pit. The fire pot is cylindrical in form and of sufficient size to hold a quantity of fuel not necessitating continuous firing or attention. The door for feeding fuel is large, and at such a hight as to admit of fuel being supplied and distributed to any portion of the grate desired. The circulation of the heat is as follows: The hot gases from the fire pot come in contact with its surfaces, impinge against the bottom of the first section, circulate to the rear, and pass through the smoke flue into the expansion chamber, where, expanding, they come in contact with the top surface of the first section and the bottom surface of the second section; then passing forward to and through the flue hole in the second section, which is on the opposite side of the boiler from the first flue hole, as shown in the cut, to the second expansion chamber, and so on successively until they have passed through five expansion chambers and acted upon ten horizontal surfaces.

The return water of circulation is received into and enters the fire pot through two openings at its side and rear, and is circulated around the fire pot to its exit, at the opposite side; there it is conveyed to and through the first section, passing into the several sections directly opposite from where it enters the previous one, and so on alternately from one section to another, until it reaches the top section, where it leaves the heater. To prevent the water in its passage through the rings from going direct from the inlet to the outlet and the water around the sides remaining dead or inactive, circulating plates are introduced by which the water follows a serpentine course through each section. Provision is made for thoroughly cleaning the heater by means of large clean out doors in the front, by which any deposit may be readily and rapidly removed from both bottom and top surface of each section.

HEATING NOTES.

THE UNITED STATES RADIATOR COMPANY, Dunkirk, N. Y., are a new organization which will carry on the radiator business built up under the name of the Harrell Steam Heating Company. The change is in the name only, the management remaining the same. Some disadvantage has been experienced from the wrong impression given by the old name. The business has grown in the five years of its existence till it taxes the capacity of the large new buildings in which the manufacturing is done. An increasing trade is expected when the new things that are in preparation are put on the market.

J. HENRY SMITH has retired from the firm of Getchell & Co., Bangor, Maine. Geo. W. Getchell will continue the plumbing and heating business under the same name.

THE CERTIFICATE OF INCORPORATION of the Queen City Radiator Company of Buffalo, N. Y., has been filed. Their capital stock is $300,000. The directors are Walter F. Bryant, Orrin Bryant, William H. Harell, Nathaniel N. Hunt and Marcus M. Drake.

"WARMTH FOR WINTER HOMES" is the attractive title of an attractive pamphlet published by the United States Heater Company of Detroit, Mich. This is a little volume of nearly 100 pages, bound in colored paper, containing within its covers a general treatise on heating, many illustrations of buildings warmed by the several boilers of the United States Heater Company, and at the end a number of testimonial letters, together with illustrations of the boilers.

DION GERALDINE is at the head of a company recently formed at Chicago to abolish the smoke nuisance. Their plan is to take charge of all steam plants in the business district now controlled by the owners. It is said that they will make a contract with a man who has a steam heating plant in his building to run his engines, furnish light, heat and power cheaper than he can do it for himself, and will give a bond to carry out the contract. It is claimed that they can run a large number of small plants cheaper than the owners can operate them singly. By buying fuel in large quantities, putting on the latest devices for consuming smoke and saving coal and operating all the plants with a corps of trained engineers and firemen, they claim that they can effect a neat saving under the cost of running detached plants. Bond is given that the service will be satisfactory and guarantee is given their customers against suits under the smoke ordinance. They are confident that the plan will succeed and that when it is put in operation there will be no more complaint of the smoke nuisance in the business district.

IN A TRADE EDITION of the Quebec Morning *Chronicle* is an interesting account of the Mechanics' Supply Company, dealers in gas, water, steam and plumbing supplies, &c. Among other firms for whom they are agents are the Toronto Radiator Mfg. Company, Warden, King & Son, Jenkins Brothers, Edward F. Keating, and the Toronto Steel Clad Bath Company.

EDWIN C. MASON, Madison, Wis., will make a specialty of the heating business in future, having sold out his interests in all other lines.

THE ALEXANDER IRON WORKS have been recently organized at Alexander, Ind., and in addition to running a general foundry and machine shop, they will make a specialty of wrought iron pipe and pipe fittings, both cast and malleable, and will cut pipe to specification. They will also carry a full line of Lunkenheimer valves.

WE ARE INDEBTED to the Richmond Stove Company, Norwich, Conn., for another batch of illustrated and descriptive catalogues of the Richmond steam and hot water heaters, which they issue in the interest of their agents throughout the country. The firms are J. B. Jackson & Son, Nashua, N. H.; Higgins & Co., 379 Lexington avenue, New York; C. M. Briggs, Athol, Mass.; H. K. Austin, Reading, Mass.; E. G. Kelly, Peabody, R. I.; Barker Brothers, Newport, R. I.

THE FIRST CATALOGUE of the Fowler Radiator & Mfg. Company of 435 North Broad street, Philadelphia, Pa., is being issued to the trade. It consists of 12 pages in a dark green cover with gilt lettering, and is devoted to the Fowler radiators, showing cuts of the radiator complete and with ornamental base and cold air dampers. The radiator is also shown set up with a register taking air from outdoors. The last two pages are devoted to giving all the necessary dimensions for both their semi-direct and direct flue radiator for steam or hot water.

PRESIDENT BOND of the American Radiator Company of Chicago was a visitor at the New York office this week.

THE J. H. MCLAIN COMPANY, Canton, Ohio, have established a New York office at 69 Centre street, in the charge of D. R. McCallum, well known to the

trade throughout the United States. They are now decorating their show room previous to the arrival of their samples, when they expect to make a display of their different goods, with the Humber hot water apparatus and the Cambridge steam boiler as leaders of the line.

Among the contracts recently taken for steam heating by Rubel & Co., 75 and 77 Lake street, Chicago, can be mentioned the following: 12-flat building, of B. Eisengrath, Center avenue, near Van Buren street; 12-flat building of Mandel Bros., Vernon avenue, near Thirty-fifth street; 12-flat building of Harrison McGinsie, Boulevard place; flat building of H. Burckland, Forty-second place.

H. R. Wilson, architect, Chicago, has planned for Mr. McAdam a two-story residence, to be built on Vincennes avenue, near Forty-ninth street, to be heated by steam.

The American Radiator Company, 94 Centre street, New York, report a carload of radiators sold for shipment to England.

F. B. Townsend, architect, Chicago, has prepared plans for a two-story and attic frame residence, to be erected by J. W. Slayton, at Argyle Park, Ill. It will be finished in hardwood and heated by hot water.

Architects Raeder, Coffin & Crocker, Chicago, have prepared plans for a seven-story wholesale building to be erected at the corner of Franklin and Van Buren streets for A. E. Kent & Son. The interior is to be of mill construction and heated by steam.

A batch of circulars received from D'Este & Seeley Company, 29-33 Haverhill street, Boston, Mass., illustrate and describe a variety of the Curtis steam goods. One relates to the Curtis balanced steam trap, another to the Curtis boiler feed regulator, a third to the Curtis temperature regulator, while a little pamphlet gives descriptions and price-lists of a large number of Curtis specialties, including pressure regulators, return steam traps, &c.

Bement & Co., 226 La Salle street, Chicago, issue a small circular descriptive of the feed pump governor and automatic feed water regulators which they manufacture. A cut is shown of the governor and full description is given of its operation and essential features.

The Sam'l I. Pope Company, heating engineers, have moved their office from 360 Dearborn street, Chicago, to suit 207 Medinah Temple Building, Jackson street and Fifth avenue.

The American Heating & Construction Company are a new business house at 69 Centre street, New York. They will make a specialty of piping for power or heating and for refrigerating work. The company are composed of D. A. Bridge, well known to the trade from his long connection with the John Simmons Company, who will look after the office of the company, and C. D. Smith, formerly with the A. A. Griffing Iron Company, who will look after all outside work.

Alfred Smith, architect, Chicago, has designed a residence for J. W. Janney, to be built at 4729 Greenwood avenue, at a cost of $22,000, to be heated by hot water.

The Metal Worker was favored the past week with a call from C. S. Graves, one of the representatives of the American Boiler Company, 94 Centre street, New York, who reports a gratifying demand for the steam and hot water goods which he has to offer.

Dinwiddle & Newberry, architects, Chicago, have prepared plans for an apartment house to be built by L. G. Wells on Marshfield avenue, near Taylor street, at a cost of $35,000. It will be constructed of Georgia marble, with a red tile roof, and be heated by hot water.

F. Richter & Son, 382 Sixth street, Milwaukee, Wis., have closed a contract for heating a new $10,000 school house at Lancaster, Wis., with their fan system.

W. L. Klewer, architect, Chicago, has prepared plans for a four-story store and flat building to be erected by E. M. Raworth on North Clark street, north of Diversey, at a cost of $36,000. The interior will be divided into 16 apartments of six rooms each and four stores, to be heated by steam.

Gummey, Spering & Company, Philadelphia.

Gummey, Spering & Co. of Philadelphia, importers and manufacturers of tin plates, &c., are moving their offices and the stock formerly carried at 1023 Market street in Philadelphia to more commodious quarters. They will in future occupy the large warehouse in the newly built brick building situate 149–151 North Tenth street in that city, where there are excellent facilities for carrying a large and heavy stock of their well-known goods. The main floor space in their new quarters covers an area 55 x 176 feet, and there is a basement of the same dimensions. Convenient offices have been located on the main floor, and two very large safes installed in them. Behind the offices is an electric elevator built by Morse, Williams & Co. of Philadelphia, having a lifting capacity of 4000 pounds. They propose to carry an immense stock of tin plates, and have already on the floor, grouped according to brands, upward of 2,000,000 pounds of plates. One group of Climax roofing plates alone represents a weight of 250 tons. Other noticeable brands of roofing plates on the floor are Pennsyl Old Method, carrying 45 pounds of coating to the box of 112 sheets; Leominster, extra coated; Waldo, Alderly, Phœnix, Liberty, Eagle, Venus and Flag. Bright plates cover Phœnix, Climax and Mars brands. All these plates are made in the firm's own works at Twenty-sixth street and Washington avenue, Philadelphia. Besides their own productions they carry a large stock of imported brands of plates. They also handle large quantities of black and galvanized sheet iron, plate iron, and a general line of roofers' and metal workers' supplies, metals of all kinds, a complete line of furnace registers in iron, solid brass and bronze, and other goods of a miscellaneous character. With their other warehouse at Swanson and Catherine streets, the new quarters will enable the firm to keep up with the requirements of their increasing business, and allow of the carrying of a much larger stock than heretofore.

Morfa Tin Plate Works, one of the largest in Wales, were closed down this week owing to the depressed condition of the market.

FLASHINGS.

Detroit Conductor Pipe Company, Detroit, Mich., issue a card to the trade announcing that they have designed and built special machinery for the manufacture of corrugated conductor pipe in 10-foot lengths, for which product they claim particular advantages. The ends are said to fit together easily and the pipes are made from any gauge up to No. 24. The firm are now building machines for the manufacture of a line of eave troughs and hangers and will carry an assortment of tinners' supplies.

According to a report on the values of building stone, &c., produced in the United States during 1893, compiled by Dr. W. C. Day of the United States Geological Survey, the slate produced during the year was valued at $2,523,173, of which $1,472,275 is credited to Pennsylvania. The product of Vermont was valued at $653,572, and of New York, $204,982. The valuation of the product of other States is given as follows: Georgia, $11,250; Maine, $139,200; Maryland, $37,884; New Jersey, $3653; Utah, $850, and Virginia, $117,347.

Charles E. Eckstein & Co., who make a specialty of wrought iron ornaments, moldings, special shapes in rolled and forged iron, &c., have removed to 45 Vesey street, New York.

The Knisely & Yeldham Roofing Company, 68 to 74 West Monroe street, Chicago, have changed the name of their company to Knisely & Yeldham Company.

In a recent issue of the *Mercantile and Financial Times* is an appreciative notice of the firm of John Galt & Sons, who have just moved into their new offices in the Postal Telegraph Building, at the corner of Murrray street and Broadway, New York. The firm are wholesale and retail dealers in all the various kinds of roofing slate in demand at the present time, including Bangor, Lehigh, Chapman, Pennsylvania, Black Vermont, Red, Purple, Sea Green and Unfading Green and also the Monson and Brownville, Maine, slates.

Schaefer & Heimink is the name of a new firm in the tin, slate and metal roofing business at 1363 Third avenue, near Seventy-eighth street, New York.

Bredfield & Resig have opened a tin, copper and sheet iron working shop at 516 Santa Fé avenue, Pueblo, Col.

The American Roofing Company, St. Louis and Cincinnati, report an excellent demand for roofing, siding, &c. They are making several large shipments to Colorado and the Coast, taking advantage of the cut in freight rates. They consider the outlook very encouraging for a continuance of the present demand.

A. W. Cooper & Co., 671 West Lake street, Chicago, are to furnish the red slate roofs, copper cornice, bays, gutters, flashings, &c., for the residence and barn of R. M. Wells, Michigan avenue and Thirty-eighth street; galvanized iron work, slating, tinning and skylights for the apartment building to be erected on the south side of Boulevard place, east of Grand Boulevard, for H. M. Alfonso; galvanized iron cornices, tin shingled tower, &c., for the office building of Phiffer & Fishback, Lamont, Ill.

STOVE TRADE NOTES.

Address of President Dana.

In opening the first session of the twenty-third annual convention of the National Association of Stove Manufacturers, held in Chicago the first week in May, President George D. Dana delivered the following address:

Long established custom has made it necessary that I should address you at this time. It would afford me much pleasure to have the rule changed, but as it has to be, I shall be brief that you may devote the more time to the consideration and discussion of the most excellent papers that have been prepared for you. One of the pleasantest and most instructive features of our conventions has been the interchange of thoughts and experiences that were made in the lobbies of the hotels in which our conventions have been held. This has been both pleasant and instructive, but it has made it difficult to open our meetings promptly at the hours set. Recognizing the value of these informal gatherings in the lobbies, your officers have thought it best to cater to this desire for informal discussion, and that all may have the same opportunity, we shall at the time of the noon adjournment have luncheon served in this room, and we hope that all will remain here and by their presence help us to expedite business.

History of the Stove Trade.

In February, 1872, the stove trade was thought to be in such an alarming condition that a call was made for a meeting of manufacturers, to be held in New York City on March 6, 1872, to consider the situation. At that meeting John S. Perry presided, and, while admitting the poor condition of the trade, he gave facts and figures to show what could reasonably be expected in the future, and said: "In view of these stupendous figures, is there any occasion for undue anxiety, lest any should fail to command a fair share of business?" Time has proved the correctness of his estimates, and verified his predictions. It is remarkable how the history of the stove trade has repeated itself; the conditions existing today are analogous to those of 10 and 20 years ago. I will call your attention to the utterances of your presidents at the meetings in the years following the panics of 1873 and 1884, and let you judge the future by the past.

At the annual meeting in February, 1874, in his address the president says of the business of the previous year: "Our sales were generally satisfactory in amount and the prices well maintained up to the time of the terrible revulsion."

"The prices of the more common qualities of stoves became somewhat unsettled toward the close of the year. But it has been generally remarked that they were better maintained than might have been expected under the trying circumstances, and this was in a great measure due to the influence of the association."

"I venture to say that in no department either of mechanical or commercial industry has there been less suffering than the one which we represent, and we may confidently predict that in the work of recuperation it will be in the front rank."

Again, at the June meeting of 1874 he says: "It is a cause for regret that the general business of the country and of the world is not in a more satisfactory condition. This depression is not confined to our own country, but appears to be equally severe in Great Britain, France, Belgium and other iron producing countries."

"In our present troubles we call loudly upon the Government for aid; the Government is powerless to render any permanent assistance—demand and supply are the only regulators, and they are controlled by a power which is supreme." "After the crisis of 1837, it was not until 1844 or 1845 that any substantial improvement was apparent; after the disaster of 1857 business remained for the most part unsatisfactory until 1863 or 1864." And after reciting all this he shows his hopefulness by asking, "Does any one believe that ten years or six years, or even two, will be required after the panic of 1873 to develop a reasonable prosperity?"

In 1876 President Jewett says: "The stove trade for the past year has necessarily sympathized with the general depression growing out of the financial situation. The trade has, however, been steadily working off its surplus stock." I do not speak of this as a necessarily discouraging fact, but it is one which manufacturers must recognize. The class of men who cherish the theory that there is to be a grand reaction in trade and a recovery in prices are doomed to disappointment. The period of inflation and unhealthy speculation is past, and values are to be adjusted to a different standard. We must accommodate ourselves to the shrinkage which has already taken place, and be content with moderate margins of profit. There is no magic wand in the hands of the President or Congress that can transform the financial situation. The Government, like the stove manufacturer, must practice economy, insist on retrenchment, and labor faithfully to reduce the balance on the wrong side of the ledger. In June of the same year there was no change in the situation, and stove men were looking hopefully forward to a gradual, if not speedy, return of better times. In January, 1878, the stove trade of 1877 was pronounced as more satisfactory than for many previous years, and with reduced stocks on hand and large crops harvested, the stove men took heart, but did not dream of advancing prices; they were conservative, and in 1878 began to reap the reward of economy and patience. The words of President Sard, in June, 1884, are directly applicable at this time. He says: "The general characteristics of the spring trade have been dullness, a disinclination to buy except for the present needs, an absence of excessive anxiety to force the sale of goods, and a larger restriction of production. The smallness of profits at last year's prices served to check any tendency to lower rates, except in cases where goods were undesirable, obsolete or perhaps higher than the general market."

In February of 1885 he says: "The course of general trade during the past year has been unsatisfactory and uncertain; the hopes which were entertained in the early part of the year were not realized. Labor has been dissatisfied and unable to obtain full employment even at lower wages." In June, 1885, he says: "The depression and congestion continue to prevail."

The Business Situation Past and Present.

How very aptly these words will apply to the present condition of our business you can all see. I ask you to compare carefully the business situation then and now, and answer for yourself the question, Why should we now expect an earlier and fuller resumption of business than has been had after preceding financial troubles? After the panic of 1873, it was five years, or not until the fall of 1878, that there was any decided improvement in business. In the fall of 1879 began the boom that made the years of 1880 and 1881 so pleasant and profitable to stove makers. The condition continued up to the spring of 1884, when the failure of Grant & Ward brought on another financial depression, and called a halt in all business enterprises. In the stove trade, as well as in other lines, business was slow to improve and it was not until 1891 and 1892 that we had what could be considered generally good years. In 1893 up to within a few weeks of our last annual meeting the business had been unusually good, but the storm broke and carried away all hope of a prosperous fall trade. With the abundant harvest of last year, there seemed to be no reason why we should not have had a fairly good fall trade. In some localities it was better than in others, but generally it was not satisfactory. We then looked hopefully forward to a revival in spring. Our spring trade is now a thing of the past, and if I may judge from the reports made in answer to the request of our secretary it has been fully as much of a disappointment as was the business of last fall. Our business experience is not very different from the experience of those in other lines of trade, and like effects are the product of like causes. In my opinion the present depression, which is almost world wide, is the result of overspeculation, overtrading, overproduction. The terms are synonymous, and only vary as applied to different branches of business. We are now at a point where there is no fictitious demand; the supply is still greater than the demand, and trade will continue dull until our normal consumption is reached and dealers will once more be willing to carry on their floors more of the products that now fill our warehouses. I think it will be admitted by all that less than the usual number of stoves were in the hands of manufacturers at the close of last year's business: that less than the usual number have been made this spring, and yet the present supply is ample for all requirements. The example of those who have been forced to economize has been contagious, and those who did have means, doubtful of what the future might have in store for them, bought only what they needed. The dealer who was in the habit of carrying a dozen or more of samples on his floor and in stock cut them down one-half, and do you know that the reduction of only two stoves each in the stock usually carried by dealers means over 60,000 stoves, which is equal to the product of a very large foundry, and when this is multiplied by three, which I think can safely be done, it means that stove manufacturers have lost in the mere reductions of stocks usually carried by the dealers a business of nearly $2,000,000. This is a healthy condition for the dealer, but hard on manufacturers.

Encouraging Features.

We can get some encouragement for the future from the fact that so few stove manufacturers and so few sellers of stoves were forced to the wall during the past year. It is gratifying because it shows that the trade generally has been done on a safe and conservative basis. Another matter for congratulation is the steady maintenance of prices and terms in spite of temptation to cut; that there has been no general cutting of prices cannot be gainsaid, and it is due in great measure to this association, whose traditions have always been that it was folly to attempt to permanently gain trade by reducing prices below a paying basis, or offering terms that were unbusiness like and dangerous alike to seller and buyer. While this association has never taken any positive action on the question of terms or prices, its recommendations have always been on the right side, and the discussions have shown a strong undercurrent toward the restriction of terms and the maintenance of reasonably profitable prices, and that this has had good effect is now shown. What the condition of trade would now be had this association never existed can better be imagined than described. It is left for us to continue in the same conservative management of our business that has prevailed in the last year, and be thus able to take advantage of the better times that are sooner or later sure to come, and which we, by our action, can help to hasten.

The D. S. Phelps Company, Detroit, Mich., have an exhibit at the Detroit Pure Food Exhibition, consisting of Jewel steel ranges and Merit cast iron ranges. In connection with this display the D. S. Phelps Company make an elaborate showing of house furnishing goods, which includes two sizes of the Van Wie gas range and a specimen of the Pasteur germ proof water filter.

The Education and Production of Efficient Workmen.*

BY HENRY CRIBBEN.

The limited time I have had to devote to this subject prevents my going thoroughly into its salient points, but I will try to outline, as best I can, how in my judgment we can secure good and efficient workmen.

Let us first define what in our judgment constitutes a good and efficient molder. He should be temperate, industrious and work six days in each week, sickness or other unavoidable accidents excepted. He should be competent to perform the work assigned to him in a neat and workmanlike manner, and fully qualified at all times to make the necessary changes required of him that the business may demand. His work at all times should be made to strain weight, unless furnished dull iron by his employer, and oftentimes at less than strain weight, so that when the work is mounted into the stove, range or furnace the joints will be as perfect as the joints of the well fitted iron patterns from which he made his castings. He should see that his patterns are kept clean and free from rust, to enable him at all times to make work of quality that when finished shall nearly equal the pattern itself.

He should every day acquire some additional knowledge of his business, which is not only a trade, but an art that is at times mysterious and difficult to comprehend. He should apply himself whenever the opportunity offers to learning some part or portion of foundry practice, such as the best methods of lining the cupola, melting iron and properly mixing same after being melted in the cupola before it is allowed to run into the hand ladles. He should make a study of foundry machinery, including the blower and proper pressure required; should ascertain the best qualities of molding sand for making the different kinds of castings; should be kind in disposition, always treating his associates and employer with respect; should be honest, truthful and reliable, thus securing the respect and esteem of all with whom he comes in contact, and should constantly try to qualify himself to fill the position of foreman or superintendent, as employers will generally make their selection from among their employees if they find among them those that are qualified to fill positions of trust. Such men, in my opinion, constitute the good and efficient workmen; but this class is not numerous, and it has been the common remark of stove manufacturers when annually assembled at their meetings, "How small the number of efficient molders who have a thorough knowledge of foundry practice with the other necessary qualifications to make foremeu or superintendents." There is at this time a far less proportion of good and efficient workmen than there was 30 years ago. The only reason that can be assigned for this is that the average molder has concluded in his own mind that when he learns the trade of iron molding he is destined to be a hewer of wood and a drawer of water for the balance of his natural life, and he has no ambition to perfect himself in his business nor to improve his condition when the opportunity offers.

Classes of Workmen.

There are at the present time three classes of workmen:

1. The traveling journeyman or Ho Bo, who goes through the country from foundry to foundry, remaining a sufficient length of time to earn enough to purchase some needed supplies and pay his board, and money sufficient to keep him until he reaches his next stopping place. He is, as a rule, never satisfied with the prices paid for his work, although efficient workmen make good wages on the same work at the same price; dissatisfied with himself and his associates, he creates as far as he can among his fellows a spirit of dissatisfaction and unrest. The work he makes, as a rule, is of an unknown quantity and of a very inferior quality, and on the whole he is a very undesirable class of man to have in your employ. The presence of this class has a very demoralizing effect upon the better grade of men.

2. The class constituted of those who have never received proper instructions when learning the trade, or that made a very poor use of the education received. They know very little about the art or mysteries of iron molding and do not seem to want to learn, for in their own estimation they are properly qualified workmen and put up as many flasks as the good mechanic. But when their production is inspected and counted, there are nearly as many of their castings go back to the cupola to be remelted as go to the cleaning room, and what are accepted are of inferior quality. If you speak to them of their inefficiency and tell them how to improve their work or save more of it, they put on a look of injured innocence and tell you that they are qualified workmen who have worked at the business eight or nine years, and are too experienced at it to need instruction from any one. They are so thoroughly imbued with egotism and conceit as to make them useless to any manufacturer.

3. There is still another class composed of workmen who are always learning, always on the alert to improve, who listen attentively and respectfully to any advice or instruction imparted by the foreman or superintendent, or even to any suggestions of their associate workmen, who take pride in producing good light castings and who can be relied upon to produce at least 95 to 98 per cent. good castings of all the work they put up on their floors. You will find these men at work every day of the week and every month of the year that the foundry runs, unless prevented by sickness or accident. If they are sick and not in condition to come to the works, they always have the foreman informed of their condition, so that if necessary the work on their floors may be made by some of their associates. Their discounts in the cleaning room and mounting department are very small, and the mounter finds little or no trouble in putting their work together. Stoves, ranges and heaters made by them give satisfaction in every respect. Castings made from a proper mixture of iron and to proper strain weight seldom, if ever, break from fire when made by practical and competent workmen.

Qualifications of Competent Workmen.

One of the secrets of producing competent workmen is in the selection of intelligent young men with the necessary qualifications, who with proper instruction and opportunities will aid in educating themselves in the mechanical knowledge of the trade. The applicant to learn a trade should be required to answer satisfactorily certain questions touching his future intentions as a workmen, such as:

Are you desirous of becoming a good workman?

Are you willing to honestly devote four years of your time to learn and to master as far as possible the art of molding?

Will you implicitly obey the instructions of your foreman and instructor in all matters connected with your employment?

Will you at all times while in the foundry refrain from vulgar or profane language, and from the use of intoxicating liquors, and discourage their use among your associates, not only inside the works, but at all times?

An apprentice should be taken on trial for a month to ascertain if he has the qualifications necessary for a capable workman, and the foreman or instructor should periodically report to the employer his fitness and conduct. If he be careless and shows a disposition not to apply himself, and the foreman is of the opiniou that he has taken a dislike to his occupation, and the interest he seemed to have at the beginning is on the wane, he should be discharged at once, as he has not the qualifications necessary for an efficient workman. If, on the contrary, he evinces an interest in his occupation and a desire to learn, the foreman should give him every opportunity possible, and by counsel, advice and instruction assist him to secure the knowledge and skill he is in search of as rapidly as he is capable of receiving and applying it. He should receive encouragement from the superintendent and employer, who should take interest in the young man's efforts to become a good workman, should, when they meet, recognize him and inquire as to his progress, should stimulate him by words of praise for good conduct and application to business, and should spur his ambition to still greater efforts to become a good and skillful mechanic.

Some apprentices in the workshop, like boys in a school room, learn much faster than others, and should be encouraged, for the faster they learn the more profitable they become to their employers and the more money they earn, and if their efforts are properly recognized they will at a very early period approach to an equality with journeymen while still in their apprenticeship. If we desire to secure good and efficient workmen, we must furnish those who learn the trade with competent and qualified instructors to teach them its mysteries that lie hidden, so to speak, from the uninstructed in the brain of the qualified mechanic.

Employment of an Instructor.

All foundries employing 12 or more apprentices should employ at least one thoroughly competent instructor, as it is impossible for a foreman with his manifold other duties to find sufficient time to give that number of young meu the instruction and advice necessary to enable them to become good workmen. If from neglect on the part of employers the apprentices are allowed to do and go largely as they please, of necessity when their time has expired many of them will be found among the worthless class of journeymen mentioned above.

The utmost care should be taken in the selection of foreman and instructors who have apprentices to educate; they should be thorough mechanics, competent and willing to instruct the apprentice by imparting to him the knowledge they themselves are possessed of in a manner that will not be offensive. They must be men of good moral habits and reputation, and their every day life, both in the works and outside, should be such as to challenge criticism for moral rectitude and sobriety.

The instructor should also possess a knowledge of how to instruct so as to secure the best results. He should be a judge of human nature, and when any pupil is worthy, he should be advanced by placing him on a floor located between two good workmen who will take interest in him and give him instruction and advice. All such cases of promotion and merit should be used as an incentive to spur others on to greater efforts by calling their attention to the rapid advancement of their associate.

Training the Apprentice.

The appentice should be strictly traiued in the proper care of his patterns and tools, seeing that they are kept neat, clean and free from rust; to have a place on the floor for everything used; to observe a proper discipline, and to treat each other with respect. When he shows too great anxiety to make money on work he is accustomed to, by neglecting to do it well, he should be corrected, and if he still persists call a halt on him, by discounting all inferior work.

The apprentice should be indentured for the term of four years. The employer should feel in honor bound to give him a thorough and practical knowledge of the business, if the young man applies himself and carries out the instructions given him. It is also the duty of the employer to see and know that the instructor is doing his full duty in teaching the apprentices.

The method of indenturing will vary, as some of the States have no laws governing apprentices, and some that have laws on the subject are very unsatisfactory. As far as my knowledge extends, I would recommend the adoption of a coutract with the young man, agreeing to pay him so much per week in wages, payable weekly or upon the ordinary pay day of the establishment, and a promise of a certain sum of money per week as a bonus to be paid at the expiration of his term of apprenticeship, provided he continues in the service and performs his duties faithfully during the four years. In case he is discharged for cause, such as neglect in performing his work, drunkenness, quarreling or fighting, he forfeits all claims to such bonus. Or it may be arranged that the apprentice work by the piece after the first trial month, for during that time he has been taught the rudiments of his trade, such as shoveling and riddling sand, keeping tools and patterns in good order, tucking bars thoroughly, and ramming up flasks containing simple work in a proper manner. He can be given simple plain molding to begin upon, and advanced when he has shown that he is making progress. So that from the time he begins work he will earn equal, if not greater, wages by the piece than he would have received by the week, and he has it in his power to increase his pay from time to time by the acquirement of increased skill and dexterity.

In working by the piece he should be paid a certain percentage of the price paid the journeyman molder, and in addition thereto a bonus of a given percentage on the amount of money earned by him during the term of his apprenticeship, payable, as in the case of weekly wages, at the ex-

* Read at the convention of the National Association of Stove Manufacturers held in Chicago, May 2 and 3.

piration of his time of service, provided he has performed his duty and has fulfilled the terms of his contract.

Let the wage system be what it will, it is very essential that the employer should take an interest in the young man, and see to it that he is properly treated and given every opportunity to become a skillful workman. He should see to it personally that the instructor is doing his duty. The apprentice should have easy access to his employer, who should hear him patiently and insure him at all times just treatment. He should be encouraged to save his earnings, so that when he becomes a mechanic he will feel thankful for the interest taken in his welfare.

The Apprentice System.

The apprentice system as it has existed for the past 30 years has been a source of annoyance and trouble to a great many manufacturers and of discouragement to the apprentices, for which to a very great degree the manufacturer on the one hand and the Molders' Union on the other are responsible. Apprentices have not been properly instructed Employed for the term of four years, during the time of their apprenticeship, they often do not learn to make more than six or eight different pieces of castings, and when as journeymen they are called upon to make a class of work different from what they have formerly made they are lost, so to speak, and are unable to produce good work, so that they are compelled to search for jobs such as they have made and they become known as specialty workmen. Since the close of the war and up to 1888, some two years after the organization of the Stove Founders' National Defense Association, there had been continual strife or warfare between the Molders' Union and the majority of manufacturers, the union making unreasonable and unjust demands as to prices that should be paid for labor and the enforcement of rules that were destructive of discipline and good order in any establishment, and the manufacturers resisting such glaring injustice, so that there were continual strikes and all means, fair and unfair, were used by both parties to accomplish the defeat of the other side. The union thinking and scheming how to make a success of their strike, would persuade the indentured apprentice to quit the service of his employer by agreeing to take him into the union and making him a full fledged union man and putting into his hand a union card, although he had not been employed at the business more than ten months or a year, and certainly was not a qualified journeyman molder. Some members of the union may deny this statement, but they are either ignorant of the facts or tell a falsehood to try to cover up the dishonorable and unmanly action of their unions. As the writer personally knows, 11 of his apprentices were taken into the union during the strike in his shop in 1884, some of whom had worked at the business less than nine months. The production of what is known as the hobo, and the inefficient, know nothing workman, is therefore directly traceable in a measure to the selfishness and neglect of the employer in not giving the apprentice proper instructions, but more generally to the dishonorable practices of the Molders' Union in inducing apprentices to leave their employers and by forcing on the trade with a union card in their pocket men utterly worthless as molders. But we are now looking forward to a brighter future and the production of a superior class of workmen, for since the organization of the Defense Association of Stove Manufacturers the Iron Molders' Union has in the case of its members abandoned strikes as a remedy for the differences that arise, and lets reason, justice and common sense prevail in the settlement by arbitration of all disputes.

Earnings of Workmen.

Having given the subject of good and poor workmen some considerable thought, during the 43 years I have been engaged in the foundry business, 18 of which were spent as an iron molder, working by the day or by the piece as the occasion demanded, my opportunities for securing authentic information have been greater than those of many of my associate manufacturers or of the ordinary workman, and my experience proves that the apprentice who serves his time, and by carelessness on his own part or neglect on the part of his employer to properly instruct him fails to become a qualified workman, loses at least 40 per cent. of his earning capacity, as compared with that of the good workman. I have watched with interest the respective earnings of the two classes, and find the average wages earned by the poor hobo and his companion, Mr. Know-it-all, to be from $2 to $2.50 per day by the piece, and that of the good workman from $3.50 to $4 per day; therefore, both being physically able to perform the labor required, the good workman being employed 11 months in the year of 26 days each, would earn, at an average of $3.75 per day, $1072 50, whereas the poor workman, working the same number of days at an average of $2.25, earns only $643.50, or a difference of $429 per annum against the poor workman. This loss is not confined to one year alone, but continues with him as long as he remains in the business, and if the average number of years he works is 15, he is a total loser to the amount of $6435. This is food for thought to both the apprentice and manufacturer. If the incompetent workman for the reasons given is in 15 years a loser of $6435, how much does the manufacturer lose by his employment when he occupies the same floor space as the good workman, but produces a little more than half the amount of castings and those of an inferior quality, but using about the same number of pounds of melted iron daily to pour his molds? The capacity of the manufacturer is reduced to that extent, besides the loss of remelting the large percentage of bad castings made.

If we can teach the apprentices that they can earn $429 more a year by becoming good and efficient workmen, it will not only stimulate them to acquire a more thorough and systematic knowledge of their business, but at the same time will prove to the employer that there is a large profit to him in turning out good workmen, and it will be a long stride in the right direction. Neither is engaged in the business for the sake of the trade or occupation, but solely for the money it gives. I am convinced that when this subject is taken hold of by employers and properly presented to the young men who are learning trades, an influence will be brought to bear on them that will bring forth good results in the near future, but it must be borne in mind that to secure such results the apprentice should thoroughly learn to make all the work, and especially the most difficult in the foundry in which he is learning his trade.

Improvement of the Mechanics.

It is a fact known to all that professional men are making rapid advances, perfecting themselves by study and experience in their various professions, but the condition of the mechanic has been quite the reverse, except in isolated cases. This is not a healthy condition of affairs. There is no good reason why the mechanic should not improve and become as skillful in the different trades and as thorough master of his calling as it is possible for the professional to attain in his vocation. And we as manufacturers should all agree from this time forth, as far as possible, to try and improve the standard of our workmen, by giving encouragement to our apprentices, by furnishing them better facilities, and by assisting them to improve the opportunities as they arise.

If the work of the apprentice is changed as fast as he becomes proficient and continues to turn out perfect castings for weeks successively, it will enable him to improve and will encourage him to become more skillful, and if properly followed up until he can satisfactorily make the most difficult work in the foundry, he will help to reduce this great army of incompetents hereinbefore mentioned, and at the same time will greatly assist in securing a large increase of good and efficient workmen in the line of our manufactures.

THE FULLER-WARREN COMPANY of Milwaukee, Wis., are furnishing dealers handling their goods with water proof signs intended for display purposes. These signs are oblong in shape and are accompanied by a number of tacks specially adapted for the purpose, having sharp points and large heads. They are easily pressed into the sign for driving and do not pull or drive through as would be the case with a smaller head. These signs are embellished with the inscription, "Go to —— —— for Stewart Stoves," the blank space being left for the name of the dealer handling the goods. The inscription is in white letters upon a deep blue ground.

Profit Sharing.*

BY C. S. PRIZER.

Would not every progressive stove manufacturer welcome the inauguration of a policy in the management of his business that, without diminishing his profits, would assure to him the best and most faithful service from his employees of which they are capable? If at the same time this policy would promote friendly and sympathetic relations between his employees and himself, and would cause his employees to feel the same interest in the quality of the product and the prosperity of the business which he himself feels, would not every stove manufacturer adopt it? The advocates of that modification of the wages system known as "profit sharing" make the following claims for their scheme when applied to manufacturing interests:

That it will increase the quantity of the product.

That it will improve the quality of the product.

That it will promote economy and care in the use of materials and tools.

That it will prevent strikes and labor difficulties.

That it will effect an improvement in the character and conduct of the workmen.

That it will reduce the expenses and largely obviate the difficulties of superintendence and inspection.

That by reason of the increased product and of the economies resulting from the operation of the scheme, there will be created an extra profit beyond the profit that could otherwise be earned by the business.

Definition of Profit Sharing.

Profit sharing may be briefly defined as any system under which the employees of a business house receive, as a bonus, at stated intervals, a part of the profits of the business in addition to their stipulated wages.

The basis and methods of this distribution will be determined by the varying conditions of different industries. In fact, an investigation of the leading examples of profit sharing in this country and in Europe shows no two cases in which the plans of distribution are identical. The advocates of profit sharing assert that no employer should consider that his own profits will be diminished by the distribution of a bonus to his workmen. They insist that the system must stand or fall on the proposition that under profit sharing the workmen create an extra profit over and above the profit that could otherwise be realized. It is a part or the whole of these extra theoretical earnings created by the system that is to furnish the fund for maintaining it. Participation in profits by workmen was first advocated by Turgot, one of the ablest of the early French economists, in 1775. He claimed, as do modern advocates of the scheme, that it would furnish a powerful incentive to workmen for the rendering to their employers of faithful, thorough and conscientious service. The plan seems never to have been put into practice, however, until M. Leclaire, a Parisian house painter, applied it to his business with marked success in 1842. Since that time, up to the year 1892, according to Nicholas P. Gilman, profit sharing has been adopted by about 300 establishments in Europe and America. About 100 of these cases are credited to the United States, but the records show that a number of houses in this country have abandoned the scheme after trials varying from one to eight years. Among the establishments noted by Mr. Gilman as having the plan in successful operation in this country are:

The Century Company, publishers, New York.
Pillsbury Flour Mills, Minneapolis.
Rogers, Peet & Co., clothiers, New York.
Globe Tobacco Company, Detroit.
Haines, Jones & Cadbury, brass goods, Philadelphia.
Procter & Gamble, soap, Ivorydale, Ohio.
Yale & Towne Mfg. Company, locks, Stamford, Coun.
Rand, McNally & Co., publishers, Chicago, Ill.
J. W. Tufts, soda water apparatus, Boston, Mass
Rumford Chemical Works, Providence, R. I.
N. O. Nelson Mfg. Company, brass goods, St. Louis, Mo.

The only instance of profit sharing in the stove business, so far as I can learn, is that

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* Read at the convention of the National Association of Stove Manufacturers, held in Chicago May 2 and 3.

introduced by the late M. Jean Baptiste Andre Godiu in the management of his fouudry at Guise, France, in 1877. M. Godin is said to have been the first manufacturer iu France to substitute cast iron for sheet iron in the construction of stoves. His experience in profit sharing seems to have been eminently successful, though his plan for distributing the bonus is quite elaborate and complicated, as the following account of it will show :

Distributing the Bonus.

" The profits of the year's business, after allowance is made for operating expenses, are subject to these deductions : 1. A charge of 10 per cent. ou the value of movable property, and another of 5 per cent. on the immovable property, for depreciation. 2. Five per cent. interest on capital. 3. A certain amount for the educational privileges provided by M. Godin for his employees in his famous Social Palace. 4. A sum equal to 2 per cent. of the wages and salaries of the year for the benefit of the pension fund. The net profits remaining are then divided as follows :

" The reserve fund receives 25 per cent., a second 25 per cent. goes to the management, aud the remainder is allotted to capital as a super dividend, and to labor as a bouus on wages. The usual interest on the capital of the establishment, aud the whole amount paid out during the year in wages and salaries are added together. The proportion each sum bears to the total amount determines the respective shares of labor and capital. Thus in 1880, interest amounted to 230,000 francs, and wages to 1,888,000 francs. The bonus to labor was, accordingly, a little over eight times the amount of the super dividend to capital. The workman does not receive any part of his bonus iu cash. It is all capitalized and applied to the purchase of shares iu the busiuess. No workman is admitted to participation who is not already the owner of one share of stock. All workmeu, however, are encouraged to purchase stock. The interest on the stock held by the workmen adds considerably to their average earnings. In 1883 the house employed over 1400 workmen, of whom 793 were owners of stock, aud hence participants in the bonus dividend. It will thus be seen that there is at work in this business an evolution which will finally result in a co-operative establishment."

Payment of Bonus.

In nearly all of the recorded examples of profit sharing, the workmen are paid but a small portion, if any, of the bonus in cash. The bonus is usually invested in a pension fund, applied to the purchase of an interest in the business, used to effect an insurance policy or to purchase an annuity, which shall be available when the workman shall become superannuated by old age or illness. In nearly all cases the benefits have been made to accrue only to the more important and efficient workmen, and to these only after they have been in the employ of the house for some stipulated period.

For those employers who believe that profit sharing constitutes a solution of the ever present labor problem there is the encouraging consideration that, unlike many other proposals for the settlement of this question, the plan can be carried into effect without legislative action and without securing the assent of a majority of the voters of the country. Each employer can test profit sharing for himself, beginning, if he so desires, in a tentative and experimental way, and extending the scheme as its success may warrant.

Suggestions for Stove Makers.

Should any member of the National Association of Stove Manufacturers desire to inaugurate a system of profit sharing, I venture to offer a few suggestions as the result of my investigation of the subject.

Let the management at the close of any business year announce to as many of its employees as it deems advisable to admit to the scheme, that in order to secure their full and sincere co-operation for the success of the business, it is proposed to divide among them, in proportiou to their respective earnings at the close of the ensuing year, all of the surplus profit which it shall appear is due to their increased faithfulness, vigilance and efficiency. While this announcement to the employees should intimate that a fair and equitable method would be adopted for determining this surplus profit, the details of the method actually adopted for determining it should not be divulged to them, as the entire matter should be completely at the discretion and under the control of the employer. A number of experiments in profit sharing have failed because of differences between employers and employees regarding the amount of the bonus and the method of distributing it. Apply the plan to those employees who have been with the house for two years or more, in the following departments : molding, mounting, pattern, electro-plating, polishing, machinery, engine, selling, office.

Allow each employee the option of receiving his bouus in cash or of applying it to the purchase of stock of the company. If neccssary, arrange for the issuance of stock certificates of small denomination, iu order to afford employees better opportunity for acquiring a capital interest in the business.

The difficult feature of any plan of profit sharing which contemplates the distribution of an indeterminate bonus, is to estimate the iucrease of profit which has resulted from the operation of the plau. Various methods of estimating this increased profit will suggest themselves to the couvert to profit sharing. The average profits, in percentages, of a number of ordinary business years might be taken as a basis, and the profit of a year under the profit sbaring system in excess of such a basis might, taking into consideration the conditions prevailing during that year, be assumed to be due to the operation of the new plan. A more definite plan of distribution of profits to employees might be adopted by any stove mauufacturer who is not afraid to take the full plunge iuto the policy of profit sharing. Out of the profits of the business a defiuite percentage might be first paid to the stockholders of the company. As much of the net profits beyond that as it is deemed feasible to pay out in a cash dividend might be divided equally, or in any other proportion, between the stockholders and those employees who are admitted to participation. Of course, any plan of profit sharing contemplates, before it is inaugurated, the existence of a profit at tbe close of tbe year, and I have therefore to confess with regret, that there are a great many stove manufacturers in the United States who, for an obvious reason, are not now, and have not for many years been, in a position to begin a trial of this beneficent scheme.

Objections to Profit Sharing.

The current objections to profit shariug, so far as the literature of the subject reveals objections to it, may be summarized as follows :

If workmen are to participate in profits in good business years they should also hold themselves ready to make up losses in years of bad business, by paying back at the close of the bad year a proportion of the wages they have received.

Profit sharing on these terms would be mauifestly impracticable. If workmen are once permitted to share in the profits of a concern, they will soon insist that they be permitted to audit its books and accounts.

Profit sharing would result in undesirable publicity regarding the profits of a company.

If profit sharing is so sure to result to the advantage of both employer aud employee, why has it not been more generally adopted? After having been tried for many years, in isolated cases, the number of houses practicing it is so small as to constitute au almost infinitesimal point in the immense world of business.

Profit sharing is merely a dream of idealists and philanthropists, and therefore not adapted to this hard and practical world. Profit sharing would, if generally adopted, and if the result claimed for it were realized, put workmen at the mercy of the managers. A good business manager would so conduct affairs as to be able to pay a bonus to the employees; a poor business manager whose employees worked just as faithfully as those in the former case, would not be able to realize a bonus for them.

Objections Controverted.

It seems to me that these objections are trivial and superficial. If nothing stronger can be urged against profit sharing the advocates of that industrial policy have a stronger case than have its opponents. Workmen would receive the current wages, without deduction, even if they had not been promised participation in profits. If no profit is realized their extra exertions due to the hope of receiving a bonus, yield them no pecuniary reward.

Very few investing stockholders ask permission to audit the books of the house in which their capital is at stake, and it is therefore unlikely that workmen without any capital invested in the business would do so. That profit sharing has not been more widely adopted does not prove the policy to be without merit. A strong force is required to overcome the inertia of habit, tradition and custom. It is uo argument against auy proposed innovation to call it an impracticable dream. Every man who has ever proposed a " better way " iu any department of human activity has at first been charged with impracticability. Neither is it any argument against profit sharing to say that an iucompetent manager will not be able to distribute as large a bonus to his workmen as will a capable manager. Under the preseut system the prosperity of the workmen is also inseparably linked with that of the establishment for which he works.

There are, however, fundamental reasons why profit sharing cannot fulfill the sanguine predictious made for it by its partisans

Von Thuuen believed profit sharing to be " the only refuge and salvatiou of the working classes." Sedley Taylor, the learned English economist, gives the policy his unqualified support and asserts that its general adoption would result in great and permanent benefit to the mass of laboring men. Francis A. Walker says : " That profit sharing, if generally introduced . . . would be a cure for most of the labor troubles from which we suffer, seems to me beyond dispute." N. P. Gilman says : " Profit sharing is the one most practicable and most geuerally applicable measure of improvement (in the settlement of labor difficulties)." F. H. Giddings, a rising Americau economist, asserts that " profit sharing effects a more equitable distribution than can be realized by the unmodified wage system."

The American Association for the Promotion of Profit Sharing includes in its roll of officers, the names of such well known and practical men as Carroll D. Wright, N. O. Nelsou of St. Louis ; Alfred Dolge of New York ; Henry R. Towne of Stamford, and George A. Chace of Fall River. Yet, notwithstauding, the weight of authority given to this movement by the able and eminent men who are engaged in promoting it, I am convinced that we cauuot hope to find in profit sharing even a partial cure for the economic maladjustmeut of which the labor question is a symptom. In the cases where profit shariug has been successfully applied, the scheme has usually been carried out and reported upon by men of exceptional executive and administrative taleut, who had strong prepossessions in its favor before inaugurating it. Were profit sharing applied to every productive and distributive industry it could not raise actual wages or improve the condition of those who toil. For, assuming that it will do all that is claimed for it in increasing the product and promoting the iudustry of workingmen, it is merely equivalent to inventions and improvements which augment the efficiency of labor.

If improvements and inventions which add to the power of labor could cure the ecouomic ills that afflict us, we should long ago have reached an industrial millennium. Inventions and improvements that facilitate production are so far from constituting a solution of the labor problem that so close an observer as John Stuart Mill could say, " Hitherto it is questionable if all the mechanical inventions yet made have lightened the day's toil of any human being."

An Example of Failure.

An example of the failure of profit sharing to permanently raise wages is furnished by the history of the co operative coopers' associations of Minneapolis. At first all of these associations made money by eliminating the middleman and by effecting various economies in the manufacture of flour barrels. In his account of this interesting group of co-operative establishments Dr. Albert Shaw naively intimates that the co-operation itself was a marked success, but owing to a constant and unfortunate downward tendency in the price of barrels the workmen in these shops, who were all profit sharers, had finally to be content with the most meager returns for their labor.

That profit sharing has been applied with some degree of success in a few isolated cases is no proof that it would raise actual wages or increase profits if it were generally adopted, even assuming it to be as great an improvement as its advocates would have us believe. An improvement in machinery or in business methods may be an advantage to a house so long as the improvement

is confined to that one house, but the advantage is lost when the use of the improvement becomes general. When reading and writing were rare accomplishments the ability to read aud write conferred distinction and had a money value.

It is impossible to raise wages above the poiut to which they gravitate under given economic conditions by any system of bonuses or premiums. When the English Government, attempting to mitigate the distress of underpaid agricultural laborers, paid out of the public treasury grants in aid of wages it was found that the recipients of these grants merely offered to work for that much less.

The advocates of profit sharing exaggerate what they term the "defects of the unmodified wage system." The assumption that a mere employee has little or no incentive to faithfully serve his employer is, I am confident, contradicted by the experience of every manufacturer in this meeting. An employee can usually promote his own welfare by conscieutiously performing his duty toward his employer. The majority of workmen, in the stove business at least, instinctively put forth their best efforts to advauce the success of the husiness.

Traveling salesmen could hardly be imbued with additional ambition or euergy by the most liberal application of the profit sharing plan, as almost every traveling salesman knows that his remuueration depends directly upon the amount aud quality of his work. The saleshook is a strict and vigilant superintendent. Yet traveling salesmen do not, on the average, render any better service than the other employees of a manufacturiug establishment.

Profit Sharing in the Stove Industry.

It is doubtful whether the application of profit sharing in the industry of stove manufacturing would appreciably increase the product or improve its quality. The molders aud the mounters, who comprise a majority of the force actually engaged in the work of making the goods in this industry, are turning out as large a quantity of product as can he expected of them. It is certain that the molders, at least, could not on the average turn out more work than at present without to some exteut sacrificing health and longevity. That the piece workers in this industry do not, and need not, sacrifice quality by turning out a large quantity of product is proved by the fact that the goods of a well-known house, which probahly turns out more stove plate per molder than any other in the country, are surpassed in excellence of workmanship and finish.

That a pecuniary interest in the success of a business does not have the magic and marvelous effect upon employees with which it is credited by the advocates of profit sharing is shown by an example that has come under my own ob servation. In this case a number of employees hold small amounts of stock in the company. Neither in the quantity of the work produced nor in its quality do these stockholding employees show any noticeable evidence of superiority to the average workman who has no capital invested in the compauy. I do not wish to be understood, however, as opposing the policy of encouraging employees to invest their savings in the stock of the company for which they are working. On the contrary, I believe that policy to be a good one, so long as the house is able to declare dividends, as it has a tendency to promote reliability and reasonableness among the men.

While it seems certain to me that we cannot hope to find in profit sharing even a palliative for the evils that in these times so sorely perplex the sociologist and the economist, yet the spirit that prompts such men as Wright and Walker and Gilman to turn to this policy is noble and commendable.

The fact that demagognes and social quacks find their occupation and opportunity in the existence of the anomalous industrial conditions that prevail over the whole civilized world should not deter thoughtful and conservative men from frankly facing the problems involved in our system of producing and distributing commodities, nor from earnestly seeking a solution of these problems.

Why have the numberless inventions and improvements that so immensely facilitate the production of wealth failed to assure a good living to every man who is willing to work?

Why is it that with bounclless natural resources, which as yet we have hardly begun to use, vast numbers of men should be denied the opportunity of exchanging their labor for the things that labor produces?

What is the cause of that strange iudustrial congestion that prevents us from half utilizing the productive facilities at our command?

Why do wages, considered as a proportion of total production, constantly tend downward as the productive power of labor increases?

Why do the majority of business men find it increasingly difficult to secure an adequate return for their capital and labor?

These are the questions we must solve, or all of the splendid achievements of our civilization will finally avail us nothing.

Advantages and Disadvantages of Interchange of Information and Experience Between Stove Manufacturers.*

BY FULLER & WARREN COMPANY.

That a free and full discussion of methods employed and a frauk interchauge of data concerning every branch of the stove business would be of advantage to all members of this association seems entirely reasonable. Indeed, it can hardly be questioned, except on the supposition that the exchange of ideas would not be frankly done by some, or else that the burden of imparting information would come heaviest on a few whose knowledge is greater than that of the many. As to the first objection, while it is probably true that some would be only too willing to profit by any valuable ideas received while either refusing to impart anything valuable themselves, or doing it in such a manner that it would be of little value, it may be assumed that most people are not of that disposition. aud, therefore, any objection to iuterchanging data because of them would be many times offset by the advautages to accrue to the great majority, who, it is fair to presume, would be candid in giving, as well as receiving, information. The other supposition, that a few might give to the many without a fair return, is also not a good objection. For, while it is true that in all bodies of men there are some who, because of superior knowledge have more to give than they can receive from any other individual, it is more than probable that they could gather as much information from all the others as they themselves would he able to give.

Free and Full Discussion.

By a full and free discussion of methods and a frank interchange of data is not meant merely the discussions that occur at these annual meetings, but a willingness between individual members to exchange or give at any time, when requested to do so, any data asked for regarding methods used in manufacturing and selliug goods and collecting accounts. A knowledge of what your contemporaries are doing in manufacturing cannot fail to be of advantage; and this is so not because you may wish to use it against them, but because it sharpens your desire to be up to the times, makes you strive for new and better ways of working, and, in fact, gives you an interest and pride in your business that never comes to the man that goes along doing things in his own way, without the incentive that comes from contact with other men and methods.

Aud it is not only as a means of education that an interchange of ideas would be valuable, but it would really be a protection against unjust demands that cannot be refused, unless you can learn positively what your fellow mauufacturers are doing. In your manufacturing departments it would protect you against payment of excessive prices for labor, for men cannot reasonably continue to ask one mauufacturer to pay more than another for the same kind of work. This may seem to those who are not at present payiug as great prices for labor as some others an unnecessary reason in their case for reciprocity, but they may rest assured it applies as closely to them as to their less fortunate fellows; for the associations of their workingmen, you may he sure, do not withhold from each other any data that will enable them to secure advantages, and the time will surely come when it will be necessary for the low paying manufacturers to meet a demand for advances to equal the prices paid by others, and then, to save themselves from paying more than the others, it will be quite uecessary for them to know what the others are doing.

Some of the Advantages Resulting.

In your selling operations it would protect against unwarranted attacks on prices and terms by the retailer. As it is now the retailer has the manufacturer entirely at his mercy. He can, if he is unscrupulous, tell the salesman anything he pleases about terms offered by other manufacturers, and the salesman, in many instances, is obliged to be guided by the retailer's statements. Would this be so if the members of this association were willing to exchauge information with each other? Would the continual increase in length of terms go ou?

It is not the intention to make this a long paper, and as you are all probably familiar with such subjects, no more space will he given to illustrating it. The fact seems so clear that an honest interchange of data among the individual members of this association would be of advantage to all that it is earnestly hoped the discussions that may follow will he potent to accomplish something in the direction of an "interchange of information and experience between stove manufacturers."

* Read at the convention of the National Association of Stove Manufacturers, held in Chicago May 2 and 3.

The J. L. Mott Iron Works

of New York and Chicago have issued an attractive catalogue of furnaces, ranges and fire place heaters. It is known as Catalogue No. 1, to distinguish it from other publications of the company, No. 2 dealing with cook stoves, portable ranges and heating stoves, No. 3 with laundry ranges and iron heaters and No. 4 with furnaces and caldrons, steam kettles, &c. The printing is on an excellent quality of paper and the engravings are of such a character as to show to advantage the goods illustrated. Attention is first invited to Mott's Lenox double oven portable French range, made in several sizes and adapted for family, hotel and restaurant use. It is fitted with the makers' double action anti-clinker grate, roller ash sifter, patent warming shelf and broilers. Next in order is Mott's Defiance, made in several sizes and fitted with double ovens. It is made both portable form and adapted for brick work. Mott's St. George elevated double oven range is made in three sizes, while the single oven range under the same name is offered in one size. Mott's Defiance single oven range occupies a number of pages, after which Mott's gas shelf, provided with two burners and adapted for application to the Lenox or Defiance portable ranges, is illustrated. The closing portion of the volume is taken up with illustrations and descriptive particulars of Mott's Social fire place heater, which has been on the market for some time; the Osborne mantel stove, made under the Morrison-Sandford patent, and in construction being a return flue base burning stove with a draw center anti-clinker grate, dust flue and large illuminating section; Mott's Star furnace, made in portable form and for brick work, and the Comet, shown with and without exterior casing. Prices of galvanized iron range boilers are given, together with those of water backs, boiler stands, repairs, brick, grate bars, doors, frames, sliding dampers, &c. An interesting feature of the pamphlet is found in the illustrations of a cast iron flue lining made under Freyer's pstent, one page being devoted to an illustration showing how the lining should be built in the wall.

THE UNION STOVE LINING COMPANY of Weir Village, Mass., resumed operations last week.

A Theory of Ornamental Design Applied to the Decoration of Stoves.*

BY JOS. LEON GOBEILLE.

To most of you the title of this paper will express exactly what we will discuss in the few moments allotted to us. You will see that it is really two subjects—"A Theory of Ornamental Design" and "Practical Application of Same to Stove Decoration." Between the two a gap occurs, which for various reasons, some of them obvious enough, we will leave open for another occasion.

The theory is simply an enlargement of the Newtonian suggestion that color and sound are, if not synonymous terms, at least so closely related as to be subject to like laws and like limitations. What we wish to show at this time is that form is included with sound and color, especially as understood when we speak of ornamental details. And when we speak of form we will take Webster's first definition—"The shape or external appearance of a body or figure as defined by lines and angles."

No one here will question that the effect of forms upon the eye is discordant or harmonious, according as their outlines and embodiment are agreeable, or the contrary, to that sensibility which we call good taste. The truth of the proposition will be apparent without argument.

It may also be set down that the perfection of art in form is that rich simplicity which attracts or repels the rudest minds. Out of many examples of the effect of simple lines to influence the mind of man two have been selected, which will be instantaneous in their action upon each one of you. Remember, they are an arrangement of elements, so primitive as to come below any written or picture language.

Symbolism.

It would be remarkable if every one here should agree with me as to what arrangement of lines into form is to-day the most potent symbol in the United States, attractive or repellant, as the case may be, yet that is precisely what you will do. It is shown in diagram marked Exhibit A.

It does not seem an easy task to select another composition as the second most effective and well understood design known. It is not an Acorn, nor a Diamond, nor even a Garland, and yet, as in the design of the cross, each one of you will agree that we have selected the arrangement of straight and curved lines, which deserves to rank as a good second in this country. (See diagram marked Exhibit B.)

Let us consider it settled, then, that certain arrangements of simple lines may be attractive or repellant if there be a proper basis for the design. The cross could be of no other shape and be effective. The dollar mark might possibly be, but its composition from the letters U. S., standing for "United States," stamps it as almost an inspiration.

To go one step forward in our argument, it must be admitted that in the decoration of two similar objects, say stoves, the same elements may be used with equal skill, but unequal taste, the one being noble and attractive, the other ridiculous and repellant. We will take the liberty of using a well-known stove company's trade-mark as an example of singularly felicitous adaptation of simple elements in the diagram marked Exhibit C. Now, we will show how the same elements can be used to produce the opposite effect, that is, to repel, in diagram marked Exhibit D.

So much by way of introduction, and now we will go along together in a popular view of some of the analogies of color and sound.

Those among us who have made a serious study of design and ornamentation know something of the difficulties in the way of making an explanation of the principles involved which will be so interesting as not to trespass upon the indulgence of the average listener; but I shall avoid technicalities and purely speculative propositions, so that every one here may easily follow the procession of the argument.

We have little to do with color in the decoration of stoves, yet it will be profitable to take enough time to state some of the primary analogies between color and sound, expressed for convenience, by the musical terms Tonic, Medient and Dominant (or the Keynote, third and fifth of the scale), as shown in Exhibit F. These in color would be the three primaries, red, yellow and blue, and to make this very plain and easily followed we will use a diagram showing these in the same position on a staff as if really musical notes. (Exhibit G.)

Now in music there are seven notes, four besides those mentioned—viz: The Supertonic, the Sub-dominant, the Sub-medient and the Sub-tonic, the eighth being of course the Octave tonic and therefore the commencement of a new series. But this presents no difficulties in the adaptation of the principle in color, for we have the proper notes for the four vacant spaces, viz.: Orange, green, purple and neutral gray, or, according to Sir John D. Macdonald, orange, green, indigo and violet. (Exhibit H.)

The inclusive octave of both sound and color is very simply shown on paper, and we think a harmonic unison established, so that all will intuitively recognize it. (Exhibit I.)

In Exhibit J (not illustrated) we may see an octave on the pianoforte keyboard with the corresponding tones of color properly located, and also the principal harmonies arranged in their natural sequences. This is according to the late G. G. Finn and is not precisely the same arrangement as we have used, but it is practically identical, the difference being in the reading of the prismatic wave length.

It must not be thought that because authorities differ in minor matters regarding the scale of color there can be any question about the scientific arrangement.

In regard to the difference above noticed, it can be very simply explained in this way: Blue and red mixed together mechanically produce an intermediate pure purple, but there are other ways to get at the intermediate besides actually mixing colors; in the prism, for instance, the diffusion of the yellow ray causes two colors to be shown—indigo and violet. If we had the time other apparent discrepancies could be explained on similar lines.

Sound and Color.

From the foregoing you will see that there is an analogy between the effects produced upon the hearing and the seeing organs of sense, but the similarity is still more striking when you consider that both are produced by vibrations more or less rapid, the one striking the retina of the eye, the other the drum of the ear, tones of color or sound being pitched in exact accord with the number of vibrations per unit of time, as has been scientifically demonstrated—*e. g.*, red, our tonic, is produced upon the retina of the eye by an atmospheric movement of 477,000,000,000,000 of vibrations per second, while the corresponding sound shown here as the middle C of our musical scale at concert pitch would be about 256 vibrations on the drum of the ear for the same time, and the ratio remains almost constant from tonic to octave and from red to violet.

Gentlemen, this to me is a most fascinating subject. You will get tired of it before I do, but I will hasten all I can. It is quite possible that the future musical symphony or etude may be written out, not on a staff as now, but in colors representing homologous musical tones. These can be tinted and merged into each other until the effects not now possible of expression in musical notation may be faithfully and felicitously shown by a scheme of color. This has only been impracticable heretofore because we have had no artificial light which would enable an untrained eye to distinguish between certain colors and shades, such as blue and green and indigo and violet. Now, however, with the electric light perfected to show all the various gradations of color, we may safely predict considerable activity in this field among scientific men in the near future. In Exhibit L I have caused to be written a grand old hymn in tones of color side by side with the accepted musical score, and, lacking some better illustration, I will attempt to show on my violin how the melody may be read and interpreted by means of the gradations and modulations as shown in the colored sketch. Notice the harmony of the tints and shadings to each other. Almost any good bit of musical harmony will work up with the same beauty and consistency in tones of color.

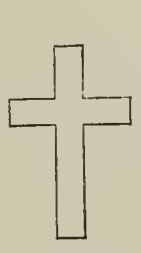


Exhibit A.

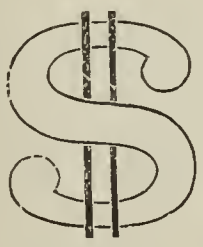


Exhibit B.



Exhibit C.



Exhibit D.

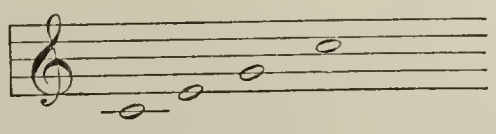


Exhibit F.

R		Y		B			R

Exhibit G.

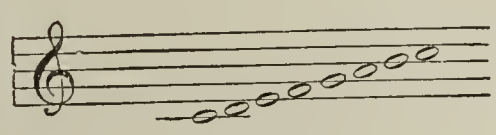


Exhibit H.

R	O	Y	G	B	I	V	R

Exhibit I.

A THEORY OF ORNAMENTAL DESIGN APPLIED TO THE DECORATION OF STOVES.

Color, Sound and Form.

Now, suppose we combine color and sound and apply our minds to the relation of form to this theory, and see what its analogies are. In the beginning it might be well to remember that a constantly widening circle of designers believe that form in effect upon the eye is distinctly analogous to that of sound upon the ear, and that color is simply the sensual side of form, differing therefrom only as the rainbow differs from the mountain crag, and concordantly joining with form and sound, all together marching in the same methodical procession of the gamut—tonic, mediant, dominant and tonic—and with the same constancy to the regular order of intervals in all the major and minor keys, while many go so far as to claim equal susceptibility to harmony, discord and effects of *chiaroscuro*, as for instance piano, forte, crescendo and diminuendo.

This being so, is it unreasonable in us to surmise that if one were sufficiently well versed in the basic principles of form we might construct a scale of forms on identical lines with color and sound? Think a moment; music was commonly known long before the notes were decided or dreamed

* Read at the convention of the National Association of Stove Manufacturers May 2 and 3.

of. Colors were grouped harmoniously long before they were classified in their positions, though after the summer shower the orderly sequence of color was proclaimed in the beautiful segment across the heavens; may it not be true that all the primary elements of form have been used over and over again in harmonious combinations by persons of artistic temperament, judging correctly by intuition, when a demonstration quite as decisive as that of the Euclidian problems, was potentially present?

Let us see what some of the probabilities are: Certainly the harmonic triad is not lacking for expression in form or outline; the straight, crooked and curved line, as exhibited in the square, the elastic curve and the circle, are in evidence. Again, if we look at form and sound in what might be termed their polite aspect, we find for the first white, gray and black composing together the monochrome, and in the second we have oratory, singing, and singing with instrumental or vocal accompaniment, or orchestration, while the structure of all musical sound bears out the theory of form in the tonic, the mediant and the dominant, all being used in quantity, arrangement and pitch to form a melody precisely as the gamut of the rainbow may be distributed and reunited in various combinations and sequences to form harmonies, contrasts or discords, form, color and sound being equally dependent for effectiveness upon an identical harmonic triad.

Now, if arrangements of sound in combination produce a distinct harmony or discord, and if combinations of color follow precisely similar lines, is it not reasonable that form may obey the same laws as color and sound? Again, if these harmonies and discords in sound and color are capable of being analyzed and classified so that from their positions in a diagram or staff a deaf man may construct a melodious and pleasing combination of tones, or one born blind can produce a harmonious color scheme, how much more reasonable that a knowledge of the Newtonian theory of color and sound will enable one skilled therein to design beautiful ornamental combinations, quite independent of any natural or acquired taste for decoration; and finally, if this person combines a scientific knowledge with a temperament susceptible to the effects of good or bad arrangements of elementary forms, such a one will of necessity compel recognition, as an expert designer, from all classes of people, especially from the educated and cultured, but with equal certainty from the rude and ignorant.

The Theory's Application.

We have not the time to go into an elementary explanation of how we place before our very eyes a chromatic scale of applied forms. It is enough that you have followed thus far and understand the possibilities of such an application. We have gone on together to an orderly and popular examination of the principles involved, and now we will discuss very briefly the application of all this to the decoration of your productions.

For, after all, and notwithstanding your patience and attention, what you most desire to hear is some suggestion which will show how to arrange the lines of proportion and ornamentation of your stoves as to produce, in a measure, the same effect upon the intuitive perceptions of the average prospective buyer that a scientific exposition would produce upon you or any other assembly of educated and cultured persons. Your goods ought to be so attractive that even the *persiflage* and hyperbole of a Fred. Gardner, or a Hope Boal, would be "love's labor lost."

In the development of a systematic scheme of ornamentation such as has been outlined, many disappointments and nonsequences occur and conclusions must be carefully made. The man who pays only superficial attention to matters of art is usually free with his opinions, often couched in the form of an *ipse dixit*, but when one devotes a lifetime to reading and study and practice, then caution and conservatism become factors in the equation. As hinted in the beginning, I am not so sure of my ground as to warrant a graphical demonstration of the gamut of form in its complete fulfillment, but of the results obtained there will be no hesitancy in placing examples before you and inviting intelligent criticism. In the first place, it is impossible to treat the formal decoration of stoves diatonically in the pattern as commonly constructed. The pattern must not be, in its original form, a wooden plate upon which is planted, almost at random, incongruous figures and shapes miscalled ornaments, but, on the contrary, the pattern proper and its decorative features should be an entity. It follows then that the completed model will be little more than a plastic sketch in clay or similar material. But there is another reason why this must be so—stoves are made of cast metal, which in process is a liquid. It is in waves and undulations while being poured, coming to rigidity very gradually, therefore, to be in unison, a similar substance must be used from which to fashion the model. Clay is not an ideal material by any means, but it is susceptible to manipulation and is the best thing known. It must first be treated for various weaknesses, particularly that of cracking when dry. In Exhibit M, five well-known methods are shown. 1, the clay model; 2, the wax model; 3, the carved wood; 4, the glue and white "compo"; and last, that friend-in-need of the man without an idea, a bit of Lincrusta-Walton. The artistic superiority of the clay and wax models is in evidence.

Another mistake is to so design a piece of ornamental cast iron as to project details of any depth at right angles to the flow of the metal in casting; curves, gentle undulations and boldness, without distinct abruptness in the rise of the higher portions, is the desideratum.

As you would not overlay one opaque color upon another, nor in sound place in juxtaposition two or more discordant notes, so in ornamentation the different elements should be amalgamated, or at least joined permanently. For example, tiles should be cast into your plates if you desire to use them, not fastened in with a frame. I show my idea in Exhibit N.

Lettering ought to be sparingly used and never merged into the design proper. After many experiments it seems that a brass letter, cast into the plate, is the most practical; and it is really very handsome. (See Exhibit O.) Above all, avoid the so-called ornamental lettering put on in warts and patches. If you have anything to say in cast iron pipe, use an honest, straightforward alphabet.

Our principle applied to the use of mica is rather bewildering; for it must be cast in the door, not fastened with a mica frame as now. And yet why not? Mica doors are the lightest parts of a stove, the easiest dismounted and replaced, thanks to the tin hinge tube. If the mica wears out why not allow the user the privilege of buying a new door, mica and all, from the original maker? To see the beauty and practicability of this, notice Exhibit P.

There is literally no end of changes necessary in your practice if this diatonic scale of form is correct; but too much time has been taken already. In closing, permit me to thank you for your attention and to express my appreciation of your kindness in inviting me to discuss with you some of the many really important matters relating to the design of ornamental patterns.

Echoes of the Convention.

— THE HEADQUARTERS of *The Metal Worker* were in Room 646 in the Auditorium Hotel, immediately opposite the entrance to the convention hall. Attention was called to the headquarters by a number of copies of the paper festooned about the entrance. The members of the association quite generally dropped in to greet the representatives of the paper, and at times there was a large party assembled discussing various phases of the stove trade.

— AMONG those who thus graced the headquarters with their presence, one of the most brilliant conversationalists was B. W. Dodson of the Detroit Stove Works, whose sallies of wit were well received, even by those who formed the target for his good natured attacks.

— ANOTHER very welcome visitor was A. C. Mott of the Abram Cox Stove Company, whose discourse was of the substantial order, as befits one who represents the dignity and sterling worth of the Quaker City.

— N. B. PERRY of the Perry Stove Company was a genial visitor, who generally permitted others to do the talking, but would occasionally interject a remark which squarely struck the heart of the subject.

— FRANCIS KERNAN of Utica told of some interesting experiences he had passed through in Chicago, which illustrated the humorous side of life, but as the subject is barred in these columns they cannot be repeated. Mr. Kernan bubbles over with humor, and evidently is more of an optimist than business men are generally, especially in these times.

— THE DELEGATION OF MANUFACTURERS from the South shivered for part of the week while the breezes blew from Lake Michigan over the Garden City. It was quite an abrupt change from a temperature of 90° or thereabouts, which they had been enduring, to 50° or even lower. For a time overcoats were in pressing demand. In the convention hall, however, the warmth of some of the discussions partly atoned for the low temperature outside.

— IT IS SAID that the leading officers of the association will rejoice in the possession of new hats at the expense of one of their number. It is the result of a bet which was made on some subject connected with the Defense Association, but the details of which seem to be carefully guarded by those concerned. The bet was of a cumulative character. When it was first made, the bettor was so positive of his position that he immediately wagered another hat with the bettee that the latter would lose. This was accepted, and immediately an associate of the bettor wagered another hat with the bettee that he would lose both bets. Again the proposition was accepted, but as the bettee thought that three hats would be too many for him to occupy at one time, he announced that if the bet should be won by him the hats would be divided among the three principal officers aforesaid. And he won.

— THE PRACTICAL MEN among the stove manufacturers were very much interested in the operations of a machine shown by J. Winfield Pugh, representing the American Machinery Company of Detroit. It is a universal trimmer, and is particularly adapted to use in the pattern shop for squaring, mitering, making core wedges, cutting segments, cutting gear teeth, &c. The cutting is done with knives, truer than with a saw and smoother than if sandpapered afterward. The machine is operated by hand, the knives moving in guides and thrown forward and back by a lever. It is mounted on a column and can be swiveled in a complete circle to suit the operator's convenience or held at any point by means of a nut.

— THE MANY FRIENDS of Frederic W. Gardner were pleased to see that he was again able to be out after having endured a long siege of illness. The primary cause of his trouble was a heavy cold which rapidly developed serious tendencies, requiring the most skillful treatment.

— FRANCIS KERNAN of Utica, N. Y., is now one of the veterans of the association, having taken part in the deliberations of the second convention and thenceforth attended every annual meeting. Mr. Kernan is one of the most genial of the many amiable members of the stove fraternity and has the happy faculty of ever looking on the bright side of things.

Taplin, Rice & Co.

We have received from Taplin, Rice & Co. of Akron, Ohio, a carefully arranged and neatly printed copy of the illustrated catalogue and price-list which they have just issued from the press. In the make up of the volume the body of each page is printed in bluish ink, while the ornamental border is in a light chocolate color. The design of the border embraces sprays of ferns, a *fac simile* of the company's trade-mark, and running down the edge, at the left hand, their name and address. The company have been engaged in the manufacture of stoves over 26 years, and during that period have used every effort to establish and maintain a high standard of excellence in the character of their goods. The future policy of the company, it is stated, "will be marked by an energy

that will command the confidence of the trade and merit the continuance of the liberal patronage" which they have thus far enjoyed, and for which they make grateful acknowledgments. The goods shown are offered under the generic name Climax, and consist of an interesting assortment covering ranges and cook stoves for burning coal and wood, and also those for burning wood exclusively. The heaters occupy the closing pages, the leading position being given to the Solar Climax, which is the company's latest addition to their line. In it is embodied many of the features which have rendered some of their other goods so popular with the trade, while portions, especially above the fire pot, are entirely new. The ornamentation is neat, nickel work being judiciously combined with the black surfaces. A line of hot air furnaces completes the catalogue, which is bound in stiff board covers, with attractive side title.

ODD PLATES.

NUMEROUS CHANGES have taken place in the domiciles of the Chicago stove houses. Lake street has lost some of the establishments which had been so long on that street that they were landmarks. Cribben, Sexton & Co. have removed their salesroom to the foundry, which is on Erie street, on the north side of the city, and S. S. Jewett & Co. have consolidated their sales department with the warehouse on the south side. The Brand Stove Company have closed up their Chicago sample room. The west side colony of stove houses has also suffered from further withdrawals. The Detroit Stove Works have removed to their new warehouse on Twenty-ninth street, and two or three houses are entertaining propositions to remove to other locations. The stove interests of Chicago are now widely scattered, being found all over the city. In few cases are there more than half a dozen concerns within easy walking distance of one another. Receiving and shipping facilities now seem to have paramount consideration among the stovemen, little thought being given to the convenience of buyers visiting the city, because such visits are steadily becoming further apart.

"THE HOME COMFORT COOK BOOK" is the name of an interesting publication which reaches us from the Wrought Iron Range Company of St. Louis, Mo. It bears date of May, 1894, and consists of 164 pages of letterpress, illustrated with numerous engravings and bound in colored paper covers, the front of which represents the interior of a kitchen fitted with a Home Comfort wrought steel range. On the smoke pipe, just above the stove top, is a plate indicating the number of Home Comfort ranges sold up to January of the present year. This number is given as 277,188. The ranges are made of malleable iron and cold rolled wrought steel, and are provided with either four or six boiler holes. The oven door drops to a horizontal position, and is said to be so braced that a heavy jar or pressure cannot break or injure it. The front and rear of the oven are fastened to the body of the range by heavy malleable frames, while the top frame is fastened to the body by heavy lugs. These ranges are adapted for use in hotels, restaurants, public and private institutions, steamboats, dining cars, &c. Among the opening pages we find extracts from newspapers relating to the company and their goods, a general view of the company's office, salesroom and factory in Toronto, Ontario, a short history of the business of the concern, together with mention of the materials employed in the construction of the Home Comfort goods. As indicated by the title of the work the greater number of the pages are devoted to recipes which the housewife is likely to find useful. There are also given a large number of testimonials, as well as lists of names and addresses of some of those who are using the company's ranges. The latter portion of the catalogue is devoted to an illustrated description of the Home Comfort steel range, following which, attention is given to a miscellaneous assortment of kitchen utensils, hot air furnaces, hotel cooks' and butchers' cutlery and an alphabetical index. The fourth page of the work is embellished with a general view of the office, salesrooms and factory of the Wrought Iron Range Company, which cover an entire block.

THE CULTER & PROCTOR STOVE COMPANY of Peoria, Ill., started their foundry April 30 after a suspension of several weeks. They put on a full force of workmen and will now run steadily. They report excellent prospects, having a good demand for their line of stoves and ranges. In fact, the foundry has been started somewhat earlier than the company had anticipated when they shut down.

SMITH & BRIGHT, agents for the sale of Graff & Co.'s Faultless and Hero furnaces, have removed to 175 and 177 Lake street, Chicago, where they have secured enlarged facilities for accommodating their increasing trade. The new location is nearer Fifth avenue, an important north and south artery of commerce and street car transportation. In their new location they will carry a much larger stock of hot air furnaces and hot water heaters. They have just closed a contract for heating a school building at Sheboygan with a combination of hot air and hot water.

THE BRILLIANT STEEL RANGE & GAS MACHINE WORKS of 9–19 Church place, Cincinnati, Ohio, send us a folder of liberal proportions illustrating the Brilliant steel ranges which they manufacture. These stoves are made for burning hard or soft coal, gas or wood, and are offered in a variety of styles and sizes. They are fitted with reversible and dumping anti-clinker grates, with automatic balance lock, asbestos lined flues, oven doors fastened with automatic gravity latch with gravity catch, revertible drop chute feed door doubled, lined and ventilated, oven plates thoroughly braced and all joints closely hand riveted. All ranges are made with or without broiler, top closet or tank attachment. The hot water heater extends the full length of the fire chamber and the heating capacity is referred to as being exceptional. The company call attention to their Brilliant gas machine, Brilliant gas cook stoves and Brilliant gas heaters. The company include E. Schmidlin, J. N. Rabenstein and C. V. Fleetwood.

A PRESS DISPATCH under recent date from Warren, Ohio, is to the effect that the Etna Foundry & Machine Company of that city have decided to discontinue the manufacture of machinery and to so alter the plant as to turn out steel ranges and hot air furnaces.

SAM S. UTTER has the sympathy of a wide circle of friends, both in and out of the stove trade, in the death of his wife, which occurred on May 9, at the St. George Hotel, Brooklyn. The funeral services were held Thursday evening, at 8 o'clock, at the residence of John L. Utter, 365A Quincy street. The attendance was large and included many representatives of the stove trade.

THE FULLER & WARREN COMPANY are distributing a couple of leaflets illustrating the Stewart range, made with large square oven and their No. 142 double oven range, made in portable form and also adapted for brick setting. These are both new constructions, the Stewart having a large draw out hearth, wrought iron ash pan, patent oval fire box and interchanging triangular Dock-ash or draw center grates, which may be removed without disturbing the water front or linings. The double oven range has sheet flues, direct draft damper and a water back which can be removed without displacing a bolt, new pattern handles on all doors, patent oval fire box and triangular revolving grate. The doors of the oven, broiler, firebox and damper are arranged to drop.

CHARLES WHITING, who represents the interests of Eugene Munsell & Co. of 218 Water street, New York, has just returned from a business trip, having secured a number of good orders for gasoline stoves.

THE BENNETT & PECK HEATING AND VENTILATING COMPANY of Cincinnati are represented in Chicago by W. H. Martin at 82 West Washington street. Mr. Martin has had a long experience in the heating and ventilating line, and takes special pleasure in handling difficult problems in satisfactorily heating large buildings for public gatherings.

THE FRIENDS of the Chicago & Erie Stove Company of Erie, Pa., are offering their congratulations on the successful introduction of the company's goods in the United States Navy. The Government has recently purchased two steel ranges, hotel size, for use aboard the man of war "Michigan." This purchase is all the more gratifying when it is remembered that the Government officials inspected a number of steel ranges, and finally selected the company's Superb Helper for trial, after which it was subjected to the test of several months' service before the purchase was completed. The "Michigan" is intended for cruising on the Great Lakes.

THE NEW ERA STEEL RANGE, made by the H. Franke Steel Range Company of Cleveland, Ohio, was used at the recent exhibition of bread baking at the store of A. S. Phinney. Six tests were made, and according to the Erie *Evening Herald*, "bread was baked in just 15 minutes by the watch, the fuel being natural gas."

THE MEYER FURNACE COMPANY of Peoria, Ill., were recently incorporated, with a capital stock of $50,000. The list of incorporators includes the names of Frank Meyer, D. Meyer, George F. Meyer and George Harms.

THE SECURITY GAS & VAPOR STOVE COMPANY, St. Louis, are directing the attention of the trade to their Security gas range, with barbecue steak broiler, copper water heater and lighting torch. The goods are substantially made, and are being placed on the market for both summer and winter use.

THE GIRARD STOVE & FOUNDRY COMPANY of Girard, Ohio, have decided to erect a new foundry building and give employment to an increased number of men. Various places for the erection of a plant are being considered, each of which, we understand, will offer some inducement. At the date of latest advices no decision had been reached as to location, but it is expected the matter will be settled before this issue reaches our readers.

TRADE REPORT.

The Iron Market.

The situation is very much mixed, the growing scarcity of Coal snd Coke interfering very considerably with operations. Production of Pig Iron was 16,522 tons less weekly on May 1 than it was on April 1; and since then we have advices that 17 other furnaces, representing a tonnage weekly of 21,192 tons, have stopped. Further additions to the list are known to be sure during the next week. The resulting scarcity of Bessemer Pig has driven the market upward to $12, Pittsburgh, transactions having been closed for upward of 30,000 tons, including one block of 13,000 sold by a Cleveland interest to a Pittsburgh concern. Even then the demand has not been filled.

If the strike should continue and establish a permanently higher range of values, which many are confident of, then the pressure of Pittsburgh, Wheeling and the Valleys in Eastern and Western markets will be much relaxed. The advance in freight rates from the Pittsburgh district east and west will aid in the same direction.

So far as the rolling mills are concerned they are able to worry along much better than the furnaces. Natural gas in some sections and oil in others is enabling them to make pretty good time thus far. The result is that in spite of the rise in raw material Finished Iron and Steel has moved but little. The feeling is a little firmer, but no real advance except for immediate requirements has been established. It seems reasonable to expect some improvement to correspond with thc higher cost.

It is an astonishing fact, but it remains a fact, that there are signs of weakness in some sections in the market for Foundry Irons.

Pig Iron.—There is only a moderate run of inquiries and current business is light in the New York market. Some of the furnace agents have had instructions to withdraw from the market, but in spite of that competition continues keen and prices have not been favorably affected as yet. We quote standard brands $12.50 @ $13.25 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9 75 @ $10.25.

The Philadelphia Pig Iron market is not in a satisfactory condition, although the volume of business is maintained, and the supply not excessive, although ample for all demands. Prices are very irregular and on the whole a shade lower than they were a week ago, but it is almost an impossibility to give exact quotations. The entire demand seems to be for No. 2 X, or No. 2 Plain, the former being quoted all the way from $11.25 to $12, with the bulk of the business at $11.35 @ $11.50, but all depends on what the Iron may be, how much is taken, and at what point it has to be delivered. Plain No. 2 and lower grades are nominally $10.50 @ $10.75, but the right kind of a buyer csn come pretty close to $10.25, although the supply of that grade is not excessive. General quotations for Philadelphia and equivalent points are about as follows :

Standard No. 1 Foundry X....	$12.50 @	$12.75
Standard No. 2 Foundry X...	11.25 @	11.75
No. 2 Plain.	10.75 @	11.00
No. 1 Soft....	11.50 @	11.75
No. 2 Soft.....	10.75 @	11.00

A little improvement is noted in the sales of local Coke Iron in the Chicago market and the inquiry has notably increased. Consumers are not disposed to purchase larger lots than heretofore. But they are inclined to purchase oftener. Sales of Southern Iron are confined to small lots in the same way, but an occasional buyer is making inquiries on round lots. At least one conspicuous Southern brand is now out of the market on account of the scarcity of furnace fuel in the South, and others are expected to be withdrawn very shortly if the strike does not speedily come to an end. The foundrymen in the Chicago district are beginning to run short of Coke, and some of them have already reduced their output of castings. This will restrict the demand for Pig Iron if it assumes any large proportions. The Foundry Coke dealers hope to be able to secure enough Coke from districts unaffected by the strike to keep the foundry trade supplied. The demand for Lake Superior Charcoal is light. One of the leading producers of this class of Iron reports that April wss the month of smallest trade he had for several years. The demand is very rarely for larger than carload lots and prices are well maintained on such quantities. Quotations are given as follows for cash :

Lake Superior Charcoal.....	$15.00 @	$15.50
Local Coke Foundry, No. 1...	11.25 @	11.50
Local Coke Foundry, No. 2...	10.50 @	11.00
Local Coke Foundry, No. 3...	10.00 @	10.50
Local Scotch.....	11.50 @	11.75
Ohio Strong Softeners No. 1..	12.60 @	13.50
Southern Silvery, No. 1.	..... @	11.50
Southern Silvery, No. 2.....	..... @	11.00
Southern Coke, No. 2..... ...	10.00 @	10.35
Southern Coke, No. 3.....	9.75 @	10.00
Southern, No. 1, Soft.....	10.25 @	10.50
Southern, No. 2, Soft.....	9.75 @	10.00
Tennessee Charcoal, No. 1...	15.00 @	15.50
Tennessee Charcoal, No. 2....	14.50 @	15.00
Alabama Car Wheel.....	17.85 @	18.00
Jackson County Silvery.....	15.00 @	16.00
Other Ohio Silvery.....	12.50 @	13.00

In the Pittsburgh district the Coke strike is playing havoc with the furnaces, more than half the number being closed. The Cleveland district is also idle. It is the impression that even with a settlement of the Coke strike prices of Bessemer Pig will not materially decline, as many of the furnaces are sold ahead for two or three months, and the available supply is bound to be limited for some time. Owing to the light demand for Foundry Iron, prices have shown very little improvement. For spot deliveries of Pig Iron we quote as follows:

No. 1 Foundry.. .....$11.00	@	$11.25,	cash.
No. 2 Foundry..... ..... 10.25	@	10.50	"
No. 3 Foundry 9.75	@	10.00	"
Bessemer.. ..... 12.00	@	12.50	"

According to our Cincinnati advices trade in Pig Iron at that center continues to be greatly restricted. Many of the furnaces are accepting no orders for forward delivery, but there is no great demand, so that prices are not much better than nominal. There has been a fair business in a small way for current consumption in this district and in the East, the orders being from one to three carloads, mainly for Coke Foundry, but with a fair sprinkle of Charcoal Iron ; and although the orders are individually small, they make a considerable aggregate. Quotations are unchsnged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1.....$10.25	@	$10.50
Southern Coke, No. 2..... 9.25	@	9.50
Southern Coke, No. 3..... .... 8.75	@	9.00
Ohio Soft Stone Coal, No. 1.... 14.50	@	15.50
Ohio Soft Stone Coal, No. 2.... 14.00	@	14.50
Lake Superior Coke, No. 1..... 12.50	@	13.00
Lake Superior Coke, No. 2. .... 11.50	@	12.00
Hanging Rock Charcoal, No. 1.. 17.00	@	17.50
Hanging Rock Charcoal, No. 2.. 16.50	@	17.00
Tennessee Charcoal, No. 1..... 13.00	@	13.50
Tennessee Charcoal, No. 2..... 12.00	@	12.50
Standard Southern Car Wheel 16.25	@	17.00
Lake Superior Car Wheel and Malleable..... .... 16.25	@	16 75

The situation in the St. Louis market is not materially changed. The strike in the Southern district has had the effect of making prices a trifle firmer. The scarcity of Coal is also having a beneficial effect, and it is pretty generally agreed that should the Coal strike continue through the month of May at least 50¢ ℔ ton will be sdded to the selling price of Iron. Ssles during the week have been fairly good. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry $10.75	@	$11.00
Southern Coke, No. 2 Foundry 9.75	@	10.00
Southern Coke, No. 3 Foundry 9.50	@	9.75
Southern Car Wheel..... 16.75	@	17.75
Lake Superior Car Wheel.. 16.25	@	16.50
Ohio Softeners..... 14.25	@	14.50

Metal Market.

Pig Tin.—Regular trade purchases have been routine in character and merely fair all told. Speculative movement has been moderate also. Still prices have climbed quite as much as London fluctuations warranted, finally getting up to about 20.10¢ net cssh for 5-ton or larger lots, prompt or near future delivery, with distant futures at some premium. The idea exists that pure manipulation has been largely instrumental in helping prices upward and that London operators are the chief manipulators. This idea is not without reason, since London fluctuations have apparently governed local prices in a great degree irrespective of the statistical position on this side of the Atlantic, while local representatives of leading London operators have been the stiffest bidders on both nearby and distant future deliveries. In actual sale prices have been carried to 20.10¢ @ 20.15¢ net cash for 5-ton or larger lots, while up to 20¼¢ regular terms were paid for ordinary jobbing parcels. Small lots from store are quoted at 21¢ @ 21¼¢ ℔ lb. The supply in first hands here, it is estimated, does not exceed 700 tons, or the equivalent of about three weeks' consumption.

Copper.—The situation is wholly unchanged. Home consumers are slow buyers and exporters more carefully in view of the weakish condition of the European market. The foreign markets, it is claimed, are not paying over the basis of 9¼¢ for Lake Superior Ingot, relatively more for other varieties and special rates to large home consumers are said to be the rule rather than the exception. This on speculative offers to sell at 9.40¢ gives the market a weak appearance, although 9.50¢ stands as the popular quotation Electrolytic is freely offered at 9.25¢, and it is understood that bids of 9.12½¢ have been solicited in numerous instances. Casting stock remains at about 9¢ @ 9.12½¢.

Sheet Copper.—The market for Manufactured Copper continues tame. Orders and inquiries come in very slowly, consumers displaying an unusual lack of interest. Prices are inclined to softness.

Pig Lead.—Merely routine business has been done here, and the demand has shown no spirit whatever. In fact, the only display of life was on the part of a few speculators who ventured to offer to sell at as low as 3⅞¢ for June and July delivery. They sold very little, if anything, although brokers obtained 3.40¢, 3.42½¢ and 3.45¢ for carload lots of desilverized from consumers. The indications are that a "bear" interest has been striving to force values lower by tricks with which they are familiar, and that speculative circles have been used to best advantage in that connection. The consumptive demand has been comparatively feeble both for Pig and manufactured Lead. Jobbers' price for small lots of the former remains at from 3⅞ to 4¢ per lb.

Spelter.—Very little business has been done here and the Eastern demand has continued extremely tame. All signs of speculative interest have vanished, and the best efforts with consumers have been slimly rewarded, purchasers being satisfied to provide only for their immediate wants. Hence a flat sort of market, with prices still rather soft at about 3.50¢ @ 3.55¢ for common Western, delivered here or at common point, with an advance of about ¼¢ on small quantities. Stocks are, however, lower than ever, and any large orders would suffice to send prices upward.

Antimony.—Sales have been made at 8¾¢ @ 8⅞¢ for Hallett's, 10⅛¢ @ 10¼¢ for Cookson's, and corresponding prices for other grades. The jobbing demand has been very fair, and prices for small quantities steady, at an advance of about ¼¢ on those above named.

Nickel.—Prices are considerably apart, varying according to size of order, &c. There is merely routine business. The range of 45¢ @ 50¢ is quoted.

Tin Plates.—It cannot be said that the market displays any change in the direction of improvement. Consumers have been taking spot goods in a very limited way only. Purchases from store fall considerably below the average for the season, and individual orders are generally of the small hand-to-mouth character with which dealers have become so familiar of late. Even those customers who in ordinary times are the most liberal buyers appear unwilling at the present time to take a box beyond what they actually need to fill their passing requirements, notwithstanding the low prices now ruling. Future deliveries also are in limited demand, and are confined to a very few weeks ahead, in view of possible tariff changes in the near future. Import shipments continue light and stocks in importers' hands are becoming attenuated. Scarcity is noted in some lines of imported Plates, yet prices remain rather weak, though showing no quotable change. In regard to the Tin Plate market in the West, our Chicago representative reports as follows: Roofing Plates are very scarce. Every American mill appears to be loaded up with business, and brands are being withdrawn from the market, as the manufacturers are not in shape to take additional orders for early delivery. Under the circumstances prices might be expected to advance, but for some reason the scarcity has so far failed to enhance values.

A special cable dispatch to *The Iron Age*, dated London, May 9, describes the British Tin Plate market as follows:

In Tin Plate business has been limited, but there is some sign that buyers are more inclined to make contracts. Canadian buying of Charcoals and Ternes is particularly favorable. Stocks at Swansea are now about 276,000 boxes. Output of works has greatly receded owing to dispute with operatives, but is still fair and exceeds shipments. Liverpool quotations are as follows:

IC Charcoal, Alloway grade	12/ @ 12/6
IC Bessemer Steel, Coke finish	11/3 @ 11/6
IC Siemens " " "	11/6 @ 11/9
IC Coke, B. V. grade, 14 x 20	Nominal.
Charcoal Terne, Dean grade	10/3 @ 10/6

Sheet Iron.—Galvanized Iron shows a firmer feeling, and some mills are said to have withdrawn their quotations. Yet jobbers maintain that the demand for this material is still on an exceedingly narrow scale and that at present prices it scarcely pays them to handle it at all. Black Sheets, except those of light gauge for tinning, are moving slowly, consumers having apparently placed their orders with the mills for all that they will require this side of July. Prices are unchanged at their former low level.

Chicago Report.

Scrap.—Business continues very light. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3⅛¢

Anthracite.—Dealers report very little trade moving. The famine in soft Coal has not yet been severe enough to cause consumers to turn to hard Coal. Carload lots of 12 net tons or over are quoted as follows:

	Egg, Sto. Grate.	and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

THE JOHN SIMMONS COMPANY, 106–110 Centre street, New York, dealers in Pipe and Pipe Fittings and Supplies, are issuing a circular on Ash Cans, giving their experience with those of ordinary manufacture and by means of a half tone engraving show them after two months' use. They state that their experience has been unsatisfactory and that they have got up an Ash Can for their own use which they are now offering to the trade.

THE TRADE will be interested in the announcement on another page of Smith & Winchester, Boston, Mass., which calls attention to the Boiler they are just putting on the market, which is to be known as the Winchester. They invite the trade to arrange for agencies for this new apparatus.

E. W. BLISS COMPANY, Brooklyn, N. Y., issue notice to the trade that they have lately removed their Chicago office and works from their former location at 414 Canal street to more commodious quarters at 100, 102 and 104 West Washington street, where they will continue a representative line of their Presses, Drop Hammers, Shears and Sheet Metal Machinery. The Chicago office is still in charge of C. W. Ellsworth, late superintendent of the Chicago Stamping Company, whose large experience with tools of this class from the user's standpoint will, it is pointed out, be of value to customers in the selection of machines and methods.

TWO ROLLING MILL PROJECTS are interesting the citizens of Anderson, Ind. One of these is a sheet mill to manufacture Merchant Sheets and Black Plates for tinning, and the other is a rod and wire mill, probably in connection with the wire nail works of the Hazen Company.

KIECKHEFER BROS & Co., Milwaukee, Wis., will soon enter upon the manufacture of Enameled Ware, and with this end in view have commenced the erection of a $150,000 addition to their already extensive plant. They will manufacture Enameled Ware in all colors and styles. The new department will give employment, it is expected, to some 200 skilled workmen.

MILLER, SLOSS & SCOTT is the name of the hardware firm who have succeeded the late Huntington-Hopkins Company of San Francisco.

ON THE NIGHT OF MAY 3 the works of the Cincinnati Tin & Japan Company, Sycamore and Canal streets, Cincinnati, Ohio, were completely gutted by fire. The total loss is estimated at about $70,000, covered by insurance. The outside walls of the building, however, were not injured by the fire and the company will rebuild immediately.

CONDITION OF THE

Hardware Trade.

THE FINE WEATHER and the natural movement of trade have induced something of an increase in the volume of business from the retail trade, and many carefully assorted orders for small quantities are being received. Stocks are kept light, and bnyers are avoiding purchases at all in excess of their early needs. The tone of the market causes a close adherence to this policy, it being recognized that prices on many goods are weak as well as low. There is accordingly little confidence in the stability of present quotations, even on such goods as have receded so far as to leave little probability of their further decline. Reports from the trade indicate that on the whole a healthful financial condition prevails. Although there is some complaint in regard to collections, there are few houses who are regarded as being in financial difficulties. Quotable changes in price are few, but there is a disposition on the part of both the producers and distributors of goods to make concessions when necessary, and on many goods there has been a perceptible settling in price during the past few months. There is thus an opportunity for buyers to exercise judicious care and skill in the placing of their orders.

Advices from Chicago.—Quite an improvement is noted in general business by the Shelf Hardware jobbers. The good weather of the past week has been favorable for outdoor work, and improvements are generally being made by farmers at this time of the year. Their demand is putting the country merchants in good condition to continually add to their stocks. The crop prospects are very flattering throughout the entire Northwest, and reports received from all quarters are now very encouraging to merchants in all the jobbing centers of this section. They are advising their correspondents to have no hesitation to lay in stocks of such goods as are in ready demand, having no apprehension that prices will be lower than are now current. Some lines of staple goods are very firm and show a tendency to advance. The coal strike is, of course, the most important element in this direction, but there are other influences at work which are expected to keep prices firm, if not to advance them. The jobbers in Tinware and House Furnishing Goods are not in quite so good condition as their Shelf Hardware brethren, and so far have experienced very little improvement in their branch of trade. The Heavy Hardware jobbers likewise report business quiet in their line, owing to the light demand from manufacturing establishments whom they supply with goods.

Notes on Prices.

Wire Nails.—The market is in substantially the samc condition as last week, with perhaps a slightly firmer tone, on account of the uncertainty as to the effect of the strikes. As a result, manufacturers are not soliciting business so eagerly, and are not offering inducements so freely as a week or two ago. The volume of business continues good, though not specially heavy. It is made up for the most part of relatively small lots, but it is understood that some large buyers are in the market. Quotations for carload lots at mill are 95 cents up to $1, the former figure being usually obtainable. Small lots from store in New York are quoted at $1.15 to $1.25.

Advices from Chicago.—A good demand is reported for Wire Nails from points further west, and in some cases orders are coming in by wire. The city trade is less active than that originating in the country. Sales have been made by manufacturers at a slight advance over recent prices. Several factories are now known to have been stopped on account of the coal famine and others are expected to drop out during the present week. One of the largest concerns in this vicinity has therefore advanced its prices 5 cents per keg on Nails to be shipped from warehouse on account of the stoppage of thc factory. Mill shipments are now firm at about $1.05 to $1.10, Chicago, with an advancing tendency. Jobbers quote small lots from stock at $1.10 to $1.15, but talk of advancing their prices at an early day, owing to the pressure from the mills.

Cut Nails.—The Cut Nail market also feels to some extent the influence of the labor troubles and the uncertainty as to their duration and effect. Prices are only slightly affected, the market being given a somewhat firmer tone in view of the fact that manufacturers are not disposed to make concessions as freely as heretofore. The Western price is about 90 cents for carload lots at mill. The price of Nails delivered in New York is 95 cents to $1 base, small lots from store being held at $1.10 to $1.15.

Advices from Chicago.—Manufacturers report a fair business during the week, with moderate sales to merchants in all sections of this immediate territory. While trade in this line has not been heavy it is as large as usual at this season. Prices are continued at 95 cents, Chicago delivery, on factory lots of 55-cent average. Jobbers quote small lots from stock at $1.05 to $1.10.

Barb Wire.—The demand for Barb Wire continues remarkably good for the season. and the volume of business is fair. The tendency toward irregularities in price has been checked somewhat by the uncertainty as to the outcome and effect of the strikes, and quotations continue with a slightly better tone about as last week. They are as follows for Four-Point Galvanized: Pittsburgh. $2.05 to $2.15 ; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25 ; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—Manufacturers have experienced a falling off in the demand recently, but the stoppage of some works on account of the Coal strike has apparently counterbalanced the restriction in trade and prices continue firm. Somc manufacturers are advising their correspondents that an advance can be expected at an early day if the Coal strike does not soon terminate. Jobbers report a fair demand from stock. Quotations may be continued at $2.15, Chicago, for factory lots of Galvanized Barb Wire and $2.25 to $2.35 for small lots from stock.

Philadelphia Ice Chisel.—This article is manufactured by John Stortz & Son, 210 Vine street, Philadelphia, by whom it is sold to the trade at $2 per dozen net.

Nut Lock and Washer.—Horton, Gilmore, McWilliams & Co., 172 to 176 Lake street, Chicago, quote the following list on the Porter patent Combination Nut Lock and Washer, with a discount of 35 per cent. to the trade:

Size.			
3/32,	250 round, per pack.....	$5.00	per 1000
3/16,	" regular, " "	5.00	" "
1/4,	" " " "	5.00	" "
5/16,	" " " "	6.67	" "
3/8,	" " " "	6.67	" "
7/16,	" " " "	6.67	" "
1/2,	" " " "	8.35	" "
5/8,	" " " "	8.35	" "

This Nut Lock is put up in a handsome antique oak counter case containing 21 pockets, holding about 4000 of seven sizes, assorted, and having extra pockets for ordinary washers as well.

Glass.—Manufacturers are still in an unsettled state of mind regarding the future of the Glass market, which uncertainty will not be relieved until the tariff question is settled; and under present conditions there is no incentive to store the product of factories. Demand appears to be equal to the present output of Glass, or so nearly so that stocks are not accumulating to any great extent in manufacturers' hands. It is too early to predict what effect the changes of rates in the Glass schedule of the tariff bill, as reported to the Senate May 7, will have upon the future Glass market if it passes in its present form. Pittsburgh factory quotations are reported as being 85 per cent. discount for single and 85 and 5 per cent. discount for double strength Glass. Present conditions indicate a favorable outlook for the Plate Glass trade in the near future, in anticipation of which additional factories are reported as preparing to start up. Quotations remain 70 and 10 per cent. discount for New York.

Old Metals.—The market for Old Metals is irregular, but prices remain at about their former level. Scrap Iron meets with somewhat slow sale in this vicinity. Dealers' purchasing price for Old Material is about as follows, delivered in New York:

Heavy Copper	℔ 7 1/8¢
Light and Tinned Copper	℔ 6 1/8¢
Heavy Brass	℔ 5 1/8¢
Light Brass	℔ 4 1/8¢
Lead	℔ 3¢
Tea Lead	℔ 2¢
Zinc	℔ 2 3/4¢
No. 1 Pewter	℔ 14¢
No. 2 Pewter	℔ 7¢
Wrought Scrap Iron, ℗ gross ton	$9.00 @ ....
Heavy Cast Scrap, ℗ gross ton	7.00 @ ....
Stove Plate Scrap, ℗ gross ton	4.50 @ ....
Burnt Iron, ℗ gross ton	3.00 @ 3.50

Old Rags, Paper, &c.—The demand has been good and prices fairly strong, as follows:

No. 1 White Rags	℔ 3 1/4	@ 3 1/2¢
No. 2 White Rags	℔ 2	@ 2 1/4¢
Mixed Rags	℔	3/4¢
Blues and 3ds	℔ 1	@ 1 1/4¢
Hard Sized White Shavings	℔ 2 1/4	@ 2 3/8¢
No. 1 White Book Shavings	℔ 1 1/2	@ 1 3/4¢
No. 2 White Book Shavings	℔ 1	@ 1 1/8¢
Light Book Shavings	℔	3/4¢
No. 1 Mixed Shavings	℔ 3/4	@ 1 ¢
No. 2 Mixed Shavings	℔ 1/2	@ 3/4¢
No. 1 Printed Books	℔ 1	@ 1 1/4¢
Ordinary Mixed Books	℔ 1/2	@ 3/4¢
Newspapers	℔ 2-5	@ 1/2¢
No. 1 Manila Paper	℔ 1	@ 1 1/8¢
No. 2 Manila Paper	℔ 5/8	@ 3/4¢
Bogus Paper	℔	1/2¢
Common Paper	℔	3/8¢
Straw Chips	℔	1/2¢
Binders' Clippings	℔ 1/2	@ 5/8¢
Jute Butts	℔ 1 7/8	@ 2 ¢
No. 1 Jute Bagging	℔ 1	@ 1 1/4¢
Mixed Bagging	℔ 3/4	@ 1 ¢
No. 2 Bagging	℔ 1/2	@ 3/4¢
Hemp Twine	℔ 2	@ 2 1/4¢
Manila Rope	℔ 2 1/8	@ 2 1/4¢
Jute Rope	℔ 1 1/2	@ 1 3/4¢
Mixed Rope	℔ 3/4	@ 1/8¢

Old Rubber.—The market for this material is fairly active. Prices rule

about as follows, but are subject to change, according to conditions of sale and purchase:

Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb..	@	.03½
Rubber shoes, less than carloads, ℔ lb.....	@	.03¼
Large Hose, ℔ ton.....	@	12.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

Trade Notes.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, advertise in this issue their machine made, double seamed, hot air Furnace Pipe, which they describe to be smooth as a bore, no solder, no buckling, air tight and dust proof. A coupon which appears as part of the advertisement will be accepted as the equivalent of $1 in payment for a first order of goods amounting to $10 or more.

THE JERSEY CITY GALVANIZING COMPANY, 28 Platt street, New York, will about May 16 move their office to 112 John street, New York.

CHARLES FAWCET of Sackville, N. B., is desirous of communicating with manufacturers of Cupolas, Tumbling Barrels, Polishing Mills, Emery Grinders, Lathes, Hoisting Gears, Circular Band and Jig Saws, Drills, Pulleys, Shafting, Hangers, &c., required in the complete equipment of a plant for Stove Plate work. He also desires to hear from firms supplying Nickel Plating outfits.

THE BOSTON WOVEN HOSE & RUBBER COMPANY, Cambridgeport, Mass., are distributing a little pamphlet illustrating their specialties. These include Cotton and Rubber Garden Hose, Rubber Belting and Packing, all of which are illustrated and described in a way to prove of interest and value to the trade. The company have offices in Boston, Chicago, St. Louis, Denver and San Francisco.

THE S. E. BARRETT MFG. COMPANY, manufacturers of Black Diamond Prepared Roofing, Roofing and Paving Pitch and coal tar products, 68 to 74 La Salle street, Chicago, have removed to rooms 909 to 914 Stock Exchange Building, corner of Washingtou and La Salle streets.

THE STARK MACHINE & TOOL COMPANY of Buffalo, N. Y., are favoring the trade with a catalogue of Tinners' Machines and Tools, Presses, Dies and Machinery for working sheet metal. It is a volume of something like 90 pages, profusely illustrated and bound in colored paper covers. The company refer to it as the tinners' edition of their illustrated Catalogue A No. 2, which, however, does not include all the articles which they produce. Ample descriptive letterpress is provided in connection with the numerous illustrations, so that those in want of goods of this character can readily learn of the merits claimed for them. Prices are also given, as well as an index arranged alphabetically. The company state that in addition to the Machines and Tools shown in this catalogue they manufacture a full line of foot, draw, power and double crank Presses, foot and power Crimpers and Squeezers, Double Seamers, Bending Machines and Dies of every description.

THE GEUDER & PAESCHKE MFG. COMPANY of Milwaukee, Wis., offer in their advertisement to supply dealers who purchase a quantity of the Cream City Flour Bin and Sifter with copies of a handsome booklet on the subject for distribution among their customers. We have received from the company a small pamphlet entitled "A Few Testimonials," in which are collected specimens of letters received from those who have used the Bins.

JAMES W. ROSS, room 647 The Rookery, Chicago, shows superb samples of the galvanized sheets now being made by the Whitaker Iron Company of Wheeling, W. Va. The crystallized surface is remarkably handsome, the coating is perfectly smooth and it adheres tenaciously to the body of the sheet, which is of very soft but tough steel.

SCRAP.

NORTON BROTHERS of Chicago are negotiating for the purchase of a part of the output of the Ellwood Tin Plate Company, Ellwood City, Pa. The plant of this concern was recently put in operation and will manufacture black sheets for tinning purposes. The concern have a four-mill plant and will give employment to about 100 men when in full operation.

WE LEARN from Nathan A. Taylor of the firm of N. & G. Taylor Company, Philadelphia, who was in this city last week, that their works are very busy at the present time, and their 19 pots are at present all in operation. A majority of the pots are making terne plates, but some six of them are operating on bright plates. Messrs. Taylor & Co. enjoy an excellent demand for their goods, and make it a point to keep on hand a full assortment of all sizes to meet the wants of their customers.

THE NEW ROLLING MILL of the Baltimore Iron, Steel & Tin Plate Company, at Baltimore, Md., is now in operation, giving employment to 70 additional hands and increasing the weekly output from 1200 to 1800 boxes. It is said to be the purpose of the company to build three additional mills at once, each of which will have a capacity of 600 boxes a week. They will be equipped with the most approved appliances and will cost about $40,000.

EXPORTS OF TIN AND TERNE PLATES from Great Britain in the month of April were 24,000 tons, against 39,000 tons in April, 1893. Of these amounts shipments to the United States were 13,000 tons and 31,000 tons respectively.

OPERATIONS AT THE new tin plate works of Meurer Bros. Company, Flushing avenue, Brooklyn, are proceeding with abundant success. Six pots are now installed and in regular work, turning out an average of 1700 boxes of tin and terne plates weekly. Three more pots are to be added within a short time. Messrs. Meurer have succeeded in producing coke tins and roofing plates of a quality that compares exceedingly favorably with imported material of a similar grade, and their product has been so favorably received by the trade that their orders exceed the present capacity of production. As yet the works have only been running during the day, but a night shift will shortly be put on, thereby doubling the present output. An electric light plant is being installed for this purpose. Four of the tinning machines now in use are of the Thomas & White pattern, two of them being employed on bright and two on terne plates. The other two machines are of the Phillips type and are used for ternes. Each is furnished with a cleaning machine and a dusting machine is provided for every three pots, so that the handling of the plates is carried out with the greatest rapidity. An automatic steam pickling machine is about to be added, as well as a steam shearing machine. In addition to their regular guaranteed plates, Meurer Bros. Company are now making three qualities of ternes, named respectively Grace, Superior and Standard, as well as Brooklyn coke tins and Florence charcoal tins.

THE TIN PLATE WORKS to be erected at Washington, Pa., by a strong company of New York capitalists, in conjunction with N. E. Whitaker of Wheeling, W. Va., will be a notable addition to the American tin plate manufacturing industry. In addition to rolling mills of ample capacity for the production of black sheets, the tinning department will be one of the largest in the country, including 18 stacks. Work on the buildings will, we understand, be inaugurated at an early date.

G. T. Ewers, 1314 Dolores street, San Francisco, Cal., distributes a circular directing attention to the patent gas burner that he has invented. A feature of it is that that burner closes automatically and there is no danger from the gas being blown out ignorantly or accidentally.

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Metal and Miscellaneous Prices.

CHICAGO, MAY 10, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14x20	@ 7.25
B.V. Grade. IC, 10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25

Worcester Brand and equal.—

IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20. $9.25
Royal extra, IC, 14 x 20 ..... 7.25
Merion, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.50

Roofing Plates.

Palm, IC, 20 x 28 ..... @$11.25
Palm, IX, 20 x 28 ..... @ 14.00
Empire, IC, 20 x 28 ..... @12.00
Empire, IX, 20 x 28 ..... @15.00
Hickory, IC, 20 x 28 ..... @ 12.50
" IX, 20 x 28 ..... @ 15.50
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska IX, 20 x 28 ..... @ 17.75
Special, IC, 20 x 28 ..... @ 15.00
" IX, 20 x 28 ..... @ 18 00

Westmoreland :
IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.00

Elwood :
IC, 20 x 28 ..... $11 50

Furmston :
IC, 20 x 28 ..... $11.00

Juno :
IC, 14 x 20 ..... $5.75
IC, 20 x 28 ..... 11.50

Illinois, Old Method :
IC, 20 x 28 ..... $17.00

E. L.:
IC, 20 x 28 ..... $12.50

Jessie :
IC, 20 x 28 ..... $12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28 ..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20 ..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28 ..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia, IC, 14 x 20 (Stamped) 7.25
" IC, 20 x 28 (Stamped) 14.50
Maple, IC, 14 x 20 (Stamped) 6.75
" IC, 20 x 28 (Stamped) 13.50
Willow, IC, 14 x 20 ..... 6.50
" IC, 20 x 28 ..... 13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28 ..... 12.50
Globe, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
" IX, 20 x 28 ..... 15.00
" (Redipped), IC, 20 x 28 ..... 17.00

Old Process :
IC, 14 x 20 ..... 9.25
IX. 14 x 20 ..... 11.25
IC, 20 x 28 ..... 18.50
IX, 20 x 28 ..... 22.50

H. B. L., Old Style :
IC, 14 x 20 ..... 7.75
IX, 14 x 20 ..... 9 25
IC, 20 x 28 ..... 15.50
IX, 20 x 28 ..... 18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers ..... 13¢ net.
Patent Planished ..... ℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel ..... 8½¢

Galvanized.

Juniata or first quality ..... dis. 75@5%

Copper—

Ingot.

Lake ..... 10½¢ @ 11¢
Casting Brands ..... 10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gliding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch $0.35
Plain, ⅝ inch up to ¾ inch ..... .38
Plain, ½ inch up to ⅝ inch ..... .38
Plain, ⅜ inch up to ½ inch ..... .41
Plain, 5-16 inch up to ⅜ inch ..... .48
Plain, ¼ inch up to 5-16 inch ..... .65
Plain, 3-16 inch up to ¼ inch 1.00
Plain, ⅛ inch up to 3-16 inch 1.50
Plain, 2 inch up to 3 inch ..... .38
Plain, 3 inch and larger ..... Special.
Plain, smaller than ⅛ inch ..... Special.
Bronze and Copper ..... 3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter ..... 4¢

Sheet Zinc—

600 ℔ casks ..... 4.50¢
300 ℔ casks ..... 4.70¢
Loose sheets ..... 4.80¢

Lead—

Soft Pig Lead ..... 4 ¢
Bar ..... 4½¢
Pipe ..... 5½¢, dis. 10¢
Block Tin Pipe ..... 35¢
Sheet ..... 6¢, dis. 10%

Solder—

½@½ ..... 13¢
Extra Wiping ..... 11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson ..... 13¢
Hallett's ..... 12¢

Wrought-Iron Pipe—

1¼ and under, Plain ..... 60&10%
1¼ and under, Galv ..... 52½&10%
1½ and over, Plain ..... 70&10%
1½ and over, Galv ..... 60&10%
Boiler Tubes, list Oct. 24, 1892 ..... 70&10%
Casing, list Nov. 16, 1892 ..... 52½%
Inserted Joints Casing, list Nov. 16, 1892 ..... 47½%
Steel Boiler Tubes 27½%
Cold Drawn Seamless Steel Tubing 50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive ..... dis 70&10%
Other sizes ..... dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted ..... 55¢
Austin's Corrugated 60%
Gordon & Gilbert's Corrugated 60%
Ritchie's (Galv. Iron only) Cor'd 60%
Ritchie's Spiral Lock Seam, Galv'd 55%
Austin's Spiral Ribbed Pipe 60%
Plain Adjustable Elbows 60%
James A. Miller Bros. (Galv'd Iron only) Corrugated 60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list 50%

Steel Roofing—

Perfection ..... $3.50 square
Climax ..... $3.35 square
The Lloyd Spanish Tiling ..... $4.50 square

Metallic Shingles—

Cushman's ..... $1.50 square
Merchant & Co.'s Spanish Tiles :
Copper, 14 oz ..... $36.00 square
Tin ..... $9.75@$14.25 square
Steel, painted ..... $9.00 square

Drain Pipe—*Tile.*

Discount from list 70%

Paints, Oils, &c.—

Deodorized Benzine ..... 7½@8 ¢
Iron Paint, Bright Red ..... ℔ b, 2 ¢
" " Brown ..... ℔ b, 1½¢
" " Purple ..... ℔ b, 2½¢
" Ground in oil, B. Red ℔ b, 6½¢
" Ground in oil, Red .. ℔ b, 6½¢
" Ground in oil, Brown ℔ b, 5½¢
" Ground in oil, Purple ℔ b, 6 ¢
Linseed Oil, Boiled, in bbls ..... 54¢
Linseed Oil, Raw, in bbls ..... 51¢
Mineral Paints ..... 2@4¢
Orange Mineral ..... 9¾¢
Pure White Lead in Oil ..... 6@6½¢
Dry White Lead in bbls ..... 5½@5¾¢
Red Lead, American ..... 6@6½¢
Red Venetian, English, dry ..... $1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs ..... 7½¢
Sipe's Japan Oil, in bbls, ℔ gal ..... 34¢
Spirits Turpentine, in bbls., ℔ gal .. 34½¢
Asphaltum, Trinidad Refined, ℔ ton .. $45
Tarred Felt, 1 Ply, ℔ 100 ℔ $1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet $1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet $1.75
Roofing Pitch, ℔ bbl. of 300 ℔ $3.00

NEW YORK, MAY 11, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots :
Small lots ..... ℔ b, 75¢
100-℔ lots ..... ℔ b, 73¢
Ton lots ..... ℔ b, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting :
Small lots ..... ℔ b, 65¢
100-℔ lots ..... ℔ b, 60¢
Ton lots ..... ℔ b, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting :
Small lots ..... ℔ b, 60¢
100-℔ lots ..... ℔ b, 55¢
Ton lots ..... ℔ b, 50¢

Antimony—

Cookson ..... ℔ b, 10¾¢
Hallett's ..... ℔ b, 9¾¢

Brass—

Planished ..... net
Roll and Sheet ..... 25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.	
¾-in. up to 2-in.	$0.35	25 @ 30%
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝-in.	.38	
⅜-in. up to ½-in	.41	
5 16-in. up to ⅜ in	.48	
¼ in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2½ in. to 3 in., to No. 16, inclusive,	.38	

Copper and Bronze Tubing—

2¢ ℔ b more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized 60%
Galvanized, Locked Joints 60%
Tin 60%

Spiral Riveted—
Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats ..13¢ ℔ b, net

Ingot.

Lake ..... 10½¢
Ansonia Grade Arizona ..... 10 ¢
Ansonia Grade Casting ..... 9¼¢
Planished ..... net
Sheet and Bolt ..... 15¢ ℔ b, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized ..... 60&10%
Lap or Slip Joint Terne 60%

Eave-Trough Mitres—

Lap or Slip Joint ..... list, net

Elbows—

Plain Adjustable—
Tin 70%
Galvanized 70%

Crimped Tubing—
Re-Tinned or Galvanized 35%

Stove-Pipe—
Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz. 20 %

Elbows and Shoes—

Flat Crimp.

Tin 35%
Galvanized 35%

Corrugated.
Flat Crimp.
Galvanized 60%

Round or Square.
Tin 60%
Galvanized 60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ b, 2.50	2.80¢
Nos. 17 to 21	℔ b. 2.60	2.90¢
Nos. 22 to 24	℔ b, 2.70	3.00¢
Nos. 25 and 26	℔ b. 2.80	3.10¢
No. 27	℔ b. 2.90	3.20¢
No. 28	℔ b, 3.00	3.30¢
American B. B.	℔ b, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ℔ b, 11¾@12½¢
Patent Planished .... ℔ b. A. 10¢ : B. 9¢ 5%
Craig Polished Sheet Steel ..... ℔ b 8½¢

Galvanized.

	B. B	
Nos. 10 to 16		75@75&10%
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig ..... 3¾¢@4¢
Bar ..... 4½¢
Pipe ..... 5½¢, 20%
Tin Lined Pipe ..... 15¢, 20%
Block Tin Pipe ..... 37½¢, 20%
Sheet ..... 6½¢, 20%
Old Lead in exchange, 2¾¢ ℔ b.

Metal Expanded—

Manufacturers' list No. 5.

Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil ..... 6¾ @ 7½
Lead, Red, hbls. and ½ bbls ..... 6½ @ 7
Lead, Red, kegs ..... 6½ @ 7
Ocher, American ..... 1 @ 1½
Red Venetian, American ..... 1½ @ 2½
Linseed Oil :
Raw, ℔ gal ..... @ .40
Boiled ..... @ .48
Spirits Turpentine :
In bbls ..... @ .32
Putty :
In barrels and ½ hbls ..... .01¾ @ .01¾
In tubs ..... .01⅝ @ .01¾
In tin cans ..... .01½ @ .02¼
In bladders ..... .01¾ @ .02¼
Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton ..... $30.00@$35.00
Asphaltum, Rock, ℔ ton $14.00
Coal Tar Felt, 1 Ply, ℔ b ..... 2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1 42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.85
Roofing Pitch, ℔ bbl. $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra.	4¼	38½¢
Rock Wool. ordinary	2¼	27¢
Rock Wool. extra	7¼	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₱ bbl. $1.24@$1.25
Rosin, E. & F..... ₱ bbl. $1.35@$1.55
Rosin, G. & H. .....₱ bbl. $1.75@$2.10
Rosin, I. & K.....₱ bbl. $2.35@$2.65
Rosin, M. & N.....₱ bbl $2.90@$3.00

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr.....$3.25@$4.50
Pen Argyle, ₱ sqr..... 3.50@ 4.25
Peach Bottom, ₱ sqr..... 5.00@ 6.25
No. I Chapman, ₱ sqr..... 4.00@ 4.65
Lehigh Slates, ₱ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₱ sqr..... 2.70@ 3.20
Purple, ₱ sqr..... 3.50@ 4.50
Unfading Green, ₱ sqr..... 3.50@ 4.00
Red, ₱ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼..... 13½@14¢
No. 1..... 11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 ℔, ₱ ℔.....3½¢
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔.....4¢
} 5% dis.

Yager's Soldering Salts.

¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter..... .....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove,*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔..... 22¢@22¼¢
Straits, pigs, ₱ ℔..... 21¢ @ 21¼¢
Straits in bars, ₱ ℔.....22¢ @ 22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 6.12
" " IX, 14 x 20..... 6.38
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Dane, IC, 14 x 20 ..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28..... 15.00
Empire, IC, 14 x 20..... 5.75
Extra Central, IC, 14 x 20.... .....5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, 20 x 28..... .....11.00
Globe, IC, 14 x 20..... 5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20 ..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20 ..... 6.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.25
McKinley, IC, 20 x 28..... .....12.00
" IX, 20 x 28..... ....15.00
Newcastle Real Old Method, IC, 14x20. 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated. IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20..... .... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " " IX, 14 x 20..... ..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... ..... 8.00
Phœnix, IC, 14 x 20..... ..... 5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20 ..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20..... .....10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.62
" IX " 14 x 20.... 7.88
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20 ....5.37½
Vigilant, IC, 14 x 20 ....5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20 ..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20.....11.00
Merion, IC, 14x20.. ..... 6.75
Mint, IC, 14x20..... ..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" IX, 14 x 20.. .. 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25
Versailles, IC, 14 x 20 ....5.75
Youghiogheny, IC, 14 x 20... .. ..6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$7.50
20 x 28..... 15.00
IX, 14 x 20..... .... 8.75
20 x 28 .....17.50
Pontymister Grade, IC, 14 x 20..... 6.50
20 x 28.....13.00
IX, 14 x 20. .. 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20..... 5.75
20 x 28.....11.50
IX, 14 x 20..... 6.75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....$5.37½
20 x 28.....10.70
IX, 14 x 20..... 6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10.50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₱ ℔.

Melyn and Calland Grade. IC, 10 x 14.....$6.37½
" " IC, 12 x 12..... 6.62½
" " IC, 14 x 20..... 6.37½
" " IC, 20 x 28..... 12.75
" " IX, 10 x 14..... 8.00
" " IX, 12 x 12..... 8.25
" " IX, 14 x 20..... 8.00
" " IX, 20 x 28..... 17.00
" " DC, 12½ x 17..... 6.00
" " DX, 12½ x 17..... 8.00
Allaway Grade. IC, 10 x 14..... 5.75
" " IC, 12 x 12... .... 5.87½
" " IC, 14 x 20..... 5.75
" " IC, 20 x 28..... 11.50
" " IX, 10 x 14..... 7.00
" " IX, 12 x 12..... 7.25
" " IX, 14 x 20..... 7.00
" IX, 20 x 28..... 14.00
" DC, 12½ x 17..... 5.50
" " DX, 12½ x 17..... 6.50

Coke.

Steel Coke.—IC, 10x14, 14x20$5.25@$5.35
10x20..... 8.12½
20x28.....11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List..... 25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz..... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.. .....52½&10&5%
1½ and over, Plain ....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892..... .....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks.....₱ ℔ 4¼
Per ℔.....5¢ @ 5½

It Is Reported—

California.

That Wakerley Bros. of NAPA have opened a new store at CALISTOGA.

That Baker & Hamilton of SAN FRANCISCO have opened a branch establishment at LOS ANGELES. It will be under the management of William H. White. Mr. White was formerly the manager for Knapp, Burrell & Co. of SEATTLE, Wash., and is considered especially well informed in the Implement line. Mr. White will have charge through the LOS ANGELES house of all the business of the firm south of BAKERSFIELD, and including besides SOUTHERN CALIFORNIA, NEW MEXICO and ARIZONA.

Illinois.

That M. E. Smith of JANESVILLE, Wis., has opened a new Hardware store at PECATONICA.

That the Lowell Hardware Company, JANESVILLE, Wis., have purchased the stock of Hardware of William Trigg & Co., AURORA, and will close it out.

That August Bohlander has opened his new Hardware store at MELROSE PARK.

Indiana.

That A. W. Beal has sold his Hardware store at SALEM to W. A. Ratts, who will continue the business.

Iowa.

That burglars broke into D. B. Brunkskill's Hardware store at HAWARDEN a short time since and stole about $300 worth of Fire Arms, Razors, &c.

That Stebbins Bros., BONAPARTE, have sold their stock and fixtures to G. A. Van der Meullen of PELLA, the consideration being $23,000.

That Pitzer & Yeager, CANTRIL, have added a large Implement room to their Hardware store.

That E. S. Welch is now the sole owner of the Hardware store formerly conducted by Welch & Lazenby, OTTUMWA.

That James Ferman has disposed of his interest in the firm of Ferman & Kingsbury, CRESTON, to Mr. Kingsbury, who will continue the business under his own name. Mr. Ferman's withdrawal from the firm is owing to ill health.

That W. H. Stiles, GARDEN GROVE, has sold his stock of Hardware to S. Scott, who will conduct the business under the name of S. Scott & Son.

That Charles F. Beaman has established himself in the Hardware business at ATLANTIC.

That B. A. Geiser has entered the Hardware business at UNION.

Kansas.

That A. Sellers has bought out the interest of his partner, S. C. Wright, in the Hardware business, at MCPHERSON. Mr. Wright expects to engage in the Hardware business at SANTA ANNA, Cal., having arranged for the purchase of a stock of goods at that point.

That H. C. Stenger will remove his Hardware business, at HERRINGTON, to new quarters.

That Baxter & Fisher's Hardware store, at REPUBLIC CITY, was burglarized on the 26th ult.

That the Van Zandt Hardware & Implement Company, HUTCHINSON, have been incorporated. The capital stock is $25,000. The directors are J. R. Van Zandt, W. G. Van Zandt, A. Van Zandt, F. G. Delano and W. Benefiel.

Massachusetts.

That Cunningham & Co.'s Hardware store, at MILLBURY, was entirely destroyed by fire on the 7th inst.

Michigan.

That Henry Weber's Hardware store, at WEST BAY CITY, was robbed on the 29th ult. of $50 worth of goods.

That Thomas Knight has sold his interest in the Hardware store of Knight & Decker, GRAND HAVEN, to Isaac Decker, who will continue the business.

That T. D. Roy has purchased the interest of William Coltson in the firm of Roy & Coltson, KINGSTON.

Minnesota.

That the style of the C. C. Clement Hardware Company, WINONA, has been changed to that of the Winona Hardware Company. The business will be continued at the old stand as heretofore.

Price-Lists, Circulars, &c.

E. D. CLAPP MFG. COMPANY, Auburn, N. Y.: Carriage Forgings. Under date May, 1894, an illustrated catalogue and price-list shows an extensive line of Carriage Forgings. The company also make many special forgings for carriage, bicycle, typewriter, electric motor, agricultural and other purposes. The company state that they have excellent facilities for this class of work, and are prepared to name favorable prices promptly upon receipt of sample patterns of wood or metal or drawings to scale.

SABIN MACHINE COMPANY, Montpelier, Vt.: Hendry's Anti-Rattler Thill Coupling Spring. The device is a metal Spring adapted to any coupling, designed to hold the shaft in place and to prevent rattling.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

FOREMAN in tin can factory; one having had some experience in figuring on work and knowing the brands and kinds of tin plates; capable of taking charge of 200 hands; first-class reference required. Holloway, office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

A FOREMAN for brass foundry working from four to eight men; preference given to a man who can break in green help, and who has worked on plumbers' supplies; steady position for the right man. "R.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

MOUNTERS on gas ranges, also sheet iron workers. J. A. Coot & Son, 41-45 Adams street, Brooklyn, N. Y. May 5

A first-class STOVE MOUNTER for fine work; permanent job if satisfactory. "S. M.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

At once, good all round TINSMITH with some knowledge of plumbing; to steady, industrious man a steady job will be given; state wages expected, experience, and give name of last employer. E. A. Burbank, Berlin, N. H. May 5

Thoroughly competent man to take entire charge of a factory making plumbers' supplies and specialties, in brass, bronze, &c.; must be able to handle men, turn out goods economically and accurately figure costs; all communications will be considered confidential; give age, experience, &c. "Factory No. 5," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

One or two good PLUMBERS and a first-class TINSMITH accustomed to general work; state wages required. G. E. Adams & Co., Glen Falls, N. Y. May 5

Two good STOVE MOUNTERS and a PATTERN FILER. "Kentucky," office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. May 5

A FOREMAN in a large manufactory who is capable of taking charge of help and can figure cost of work from plans; must be a thorough sheet metal worker in galvanized iron, tin, brass and copper. "N. J., No. 55," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

A TINNER; a man who can tin cast iron; must know how to make and apply composition; state wages wanted. "Tinner," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

A young man as ASSISTANT to FOREMAN in a largely cornice shop in New York; must be practical and steady; good chance for advancement for an industrious man; state experience and expectations. "Honesty," office of *The Metal Worker*, 96-102 Reade street, New York City. May 5

SITUATIONS WANTED.

Under instructions, by a recent graduate of the plumbing department of the New York Trade Schools; not afraid of work; small salary. Chas. J. O'Hanlon, 391 Bridge street, Brooklyn, N. Y. May 12

By an Orange County TINSMITH; A1 milk can maker; understands all about creamery work, jobbing of all kinds and all the different branches of the trade; honest, sober and steady; best of reference. "Tinsmith," 552 Broome street, New York City. May 12

As FOUNDRY FOREMAN, by a practical molder who has had long experience on stove plate, hot air and hot water furnaces; competent in handling men to advantage; thorough knowledge of economical melting, and all modern foundry practice; first-class reference from present employers. "E. W. D.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

By a married American man 24 years of age; five years' experience in plumbing, gas and hot water fitting. "C.," Box 71, Dalton, Mass. May 12

A steady job at TIN and SHEET IRON WORK; general jobber on both inside and outside work, furnace and range work; 20 years' experience; city or country shop. N. T. Wood, No. 1402 Fairmount avenue, Philadelphia, Pa. May 12

As BOOKKEEPER, by a young man of 23; well acquainted with the retail plumbing business; seven years' experience. Albert E. Harris, 181 Dearborn avenue, Chicago, Ill. May 12

By a young man, at PLUMBING, who is a graduate of the New York Trade School and has had two years' experience in New York City; can furnish references. E. L. Plumber, 134 East Twelfth street, New York City. May 12

As SUPERINTENDENT of stamping works or FOREMAN, DIE or TOOL MAKER; 35 years of age; last six years in similar position with leading firm; thoroughly posted in sheet metal of all kinds; highest references. "Tools," care of Rudolphi & Krummel, 96 North Clinton street, Chicago, Ill. May 12

By a good TIN and SHEET IRON WORKER; 12 years' experience; city or country. Levy Himan, 329 Carpenter street, Philadelphia, Pa. May 12

A METAL PATTERN MAKER wishes a situation where he can have steady employment; is sober and reliable; used to filing and fitting stove work; also repairing; is a handy all round man. "J. M. D.," 11 Delevan street, Auburn, N. Y. May 12

As FOREMAN and CORNICE CUTTER; 20 years' experience at general job and cornice work; can hustle men and work stock to good advantage. "Estimator," 2331 Wabash avenue, Chicago, Ill. May 12

By a plumber as FOREMAN or JOURNEYMAN; capable of handling a good number of men; well acquainted with plumbing, heating and gas fitting; can estimate from plans; good references. A. Chisholm, West Saratoga street, Baltimore, Md. May 12

As SALESMAN; hardware or tinners' stock; 15 years on the road; acquainted in hardware, iron and wagon wood work. "Storrs," office of *The Metal Worker*, Fifth and Main streets, Cincinnati, Ohio. May 12

By a first-class stove mounter as FOREMAN; 21 years' experience at the trade; 15 years' experience as foreman; understands the business in all its branches; good references. W. H. Flockton, Plymouth, Mass. May 12

By a TRAVELING SALESMAN with a trade in Illinois; thoroughly understands sheet metals, tin plates, tinners' supplies, steel roofing and metal ceilings; A 1 references. "W.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

By a PLUMBER, GAS and HOT WATER FITTER; country preferred; reference if required; 24 years old; seven years' experience; no bad habits; willing to work hard; wages $2.50 a day. Wm. A. Loughrey, 196 Melrose avenue, Cleveland, Ohio. May 12

A perfect TIN and SHEET IRON WORKER and ROOFER wants a steady position in or out of town. S. Greenberg, 64-66 Canal street, New York City. May 12

By a first-class PLUMBER, steady work in city or country; thoroughly understands gas, steam, and hot water fitting. John J. Boilly, 203 East Thirty-sixth street, New York City. May 12

By a WOOD PATTERN MAKER; 20 years' experience on stoves, hot air furnaces and hot water heaters; first-class references. "Pattern Maker, No. 512," office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

As PLUMBER, by a Scotchman who has recently arrived in this country; married; country preferred. John Duncan, 26 Church street, New York City. May 12

By a first-class TIN ROOFER as a tin and sheet iron worker. A. Silverman, 781 Tenth avenue, New York City. May 12

By a sober man, on tin and sheet iron or stove work. 25 Newberry avenue, Chicago, Ill. May 12

By a good TINSMITH who understands roofing and general jobbing; have worked in the country; wages moderate for a steady position. M. Cohen, 143 Delancey street, New York City. May 12

In the country by a TINSMITH who understands job work on pumps, tin and sheet iron work; ten years' experience; can furnish tools. Lock Box No. 72, Springfield, Vt. May 12

PLUMBER and GAS FITTER understanding steam fitting and tin roofing. Daniel McCarthy, 155 Allen street, New York City. May 12

By a competent man with ten years' experience at tin, sheet iron and copper work, hot air furnaces, steam and hot water heating and plumbing; can estimate on work; have had charge of a shop; best of references; wages moderate. H. M Hoffman, 14 Sixth street, South Minneapolis, Minn. May 5

By a man who has worked at tinning, plumbing, roofing, iron railings and fire escapes, also has had experience as hardware clerk and traveling salesman; no objections to going West; Cincinnati preferred. Edwin Weisenborn, 36 Third street, Brooklyn, N. Y. May 5

A steady job in or near New York by an experienced TIN and SHEET IRON WORKER; reference if necessary. J. J. McClintock, 402 Washington street, Hoboken, N. J. May 5

As helper to a tinsmith; three years' experience. William Roberts, 2702 Eighth avenue, New York City. May 5

By an experienced PLUMBER; city or country. Patrick Kelly, 72 Navy street, Brooklyn, N. Y. May 5

By a practical TIN and SHEET IRON WORKER and CORNICE and SKYLIGHT MAKER; inside and outside work; wages moderate; best of references. Joe Farber, 2 Mill street, Yonkers, N. Y. May 5

By a PLUMBER and GAS FITTER in city or country; wages $2.75 per day. Albert Dorer, 491 Tenth avenue, New York City. May 5

By a first-class TINSMITH and GENERAL JOBBER at inside or outside work; city or country. John Phillips, 154 Madison street, New York City. May 5

By a young man 26 years of age as PLUMBER, STEAM and GAS FITTER; steady, sober and honest; has full license from Department of Public Works, certificate from the Examining Board of Plumbers and one from the Board of Health; capable of taking charge of men and estimating; also of taking charge of books; can speak German and English. "J. E. K.," care of Jos. Hollander, 75 Avenue D, New York City. May 5

By a practical TIN and SHEET IRON WORKER, 25 years of age, who learned his trade in Germany; two years' experience in this country; steady position desired, city or country; single; state wages. Louis Kreutzman, 199 Forsyth street, New York City. May 5

By a practical TINSMITH in all branches of the trade; good milk can maker; can do jobbing of all kinds; used to country work; sober and steady; country work preferred. F. M. La-Seur, 552 Broome street, New York City. May 5

"ERIE" ALUMINUM TEA KETTLE

This TEA KETTLE is made of "PURE METAL," all in one piece. No SPOUT to melt off. No SEAMS to open. No chance for LEAKAGE. Will not RUST or CORRODE. No plating to wear off. STIFF, FIRM and INDESTRUCTIBLE. Altogether the NEATEST, PRETTIEST, BEST, LIGHTEST one piece and most durable TEA KETTLE ever offered.

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AUCTION SALE

BRASS WORKING MACHINERY.

SUPREME COURT.—In the matter of the voluntary dissolution of the W. F. Washburn Brass and Iron Works, a corporation, &c., notice is hereby given that at the factory formerly occupied by said corporation, at corner of Dock and River Streets, in the city of Yonkers, Westchester County, N. Y., on Wednesday, the 23d day of May, 1894, at 10 o'clock A.M., I shall sell at public auction all the plant and machinery of said corporation, consisting of machine tools, special tools, nickel plating outfit, patterns, flasks, furnaces, shafting, pulleys and the entire mechanical equipment of said corporation for the manufacture of plumbers' fine brass work. Terms made known at sale.

JOSEPH M. STOUGHTON, Receiver.

Dated May 9, 1894.

To General Mechanical Engineers.

FOR SALE, through the death of the proprietor, the entire estate and business of the late Earnest Chanteloup of Montreal, Canada. This is an opportunity rarely met with. Only small amount required in cash. The business is situated in the heart of the city and embraces iron and brass foundry, iron and brass finishing, electrical, plating, stamping, tinsmith, coppersmith, steam fitting, plumbing, buffers', carpenters' and painters' departments. The business is at present continued by the various foremen under a general foreman. This establishment enjoys the confidence of the railway companies, governments, banks and other corporations in the country. Balance sheet to date shows a net capital surplus in the business of $248,000. In first instance apply only to

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Practical foreman with three to five thousand dollars to invest in Stove Foundry with good trade and prospects and very little home competition, must be capable of taking complete charge of works throughout. For a live man that understands his business, will make it an opportunity of a lifetime; money no object without the ability and experience; must furnish A1 references. Address "WESTERN," office of *The Metal Worker*, 96-102 Reade St., N. Y.

FOR SALE.

The old established Roofing and Cornice Works with machinery, tools and stock of Wasson & Co., Albany, N. Y. A great opportunity for a practical man. Price low. Inquire of

J. W. WASSON,
7 and 9 James St., Albany, N. Y.

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A good set Tinners' Tools. Address
FRED. M. CHAPIN, Box 65,
Scottsville, N. Y.

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A 4 or 6 foot Robinson late improved Cornice Brake, second-hand. Must be an extra bargain for cash. W. L. SALYERS,
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The address of parties having Hardware or Stove specialties, upon which exclusive control can be given for Iowa and Nebraska. Address

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Partner wanted in a plumbing, steam, gas fitting and tin roofing business, established for ten years in a growing Southern city of 35,000 inhabitants. City has just commenced 35 miles of sanitary sewerage. Best of reference required and given. Address

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One Stow's 31 inch Geared Power Squaring Shear. Will cut 3-16 in. iron, or lighter. Used very little. Call on or address

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One No. 5 Sturtevant Fan and Counter Shaft, with 38 feet of 11½-inch Galvanized Iron Blow Pipe. Address

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Stock of Hardware, Stoves and Tinware. Situated within forty miles of Chicago. Population of 8000. Address "FORTY MILES," office of *The Metal Worker*, 96-102 Reade St., N. Y.

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Quick result, high lustre, and durable in any climate. Yates Standard Paste Stove Polish at 3 to 6 cents per pound. Send for circulars.

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By the Flanders process, now in use by some of the largest firms in the country. Correspondence solicited for the erection of galvanizing or tinning plants and WELDED GALVANIZING KETTLES.

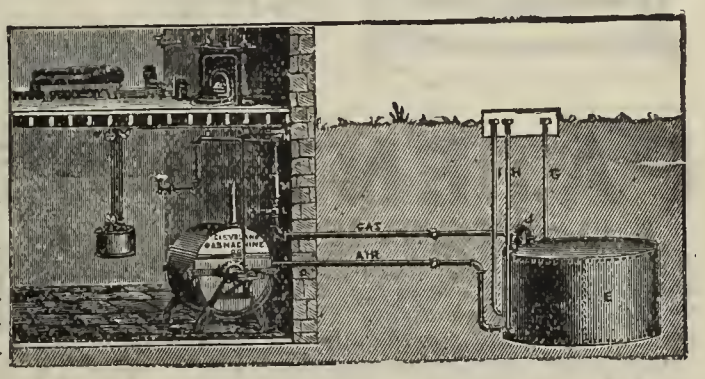
THOS. SANDS, - - - - Nashua, N. H.

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Please send for **Reduced Price** List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engines.



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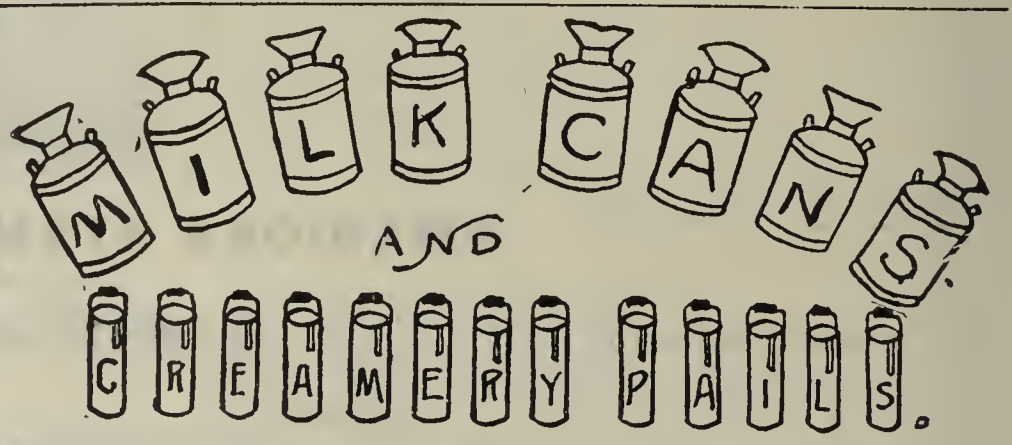
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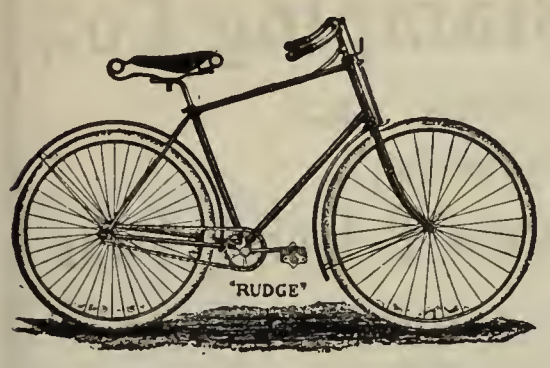
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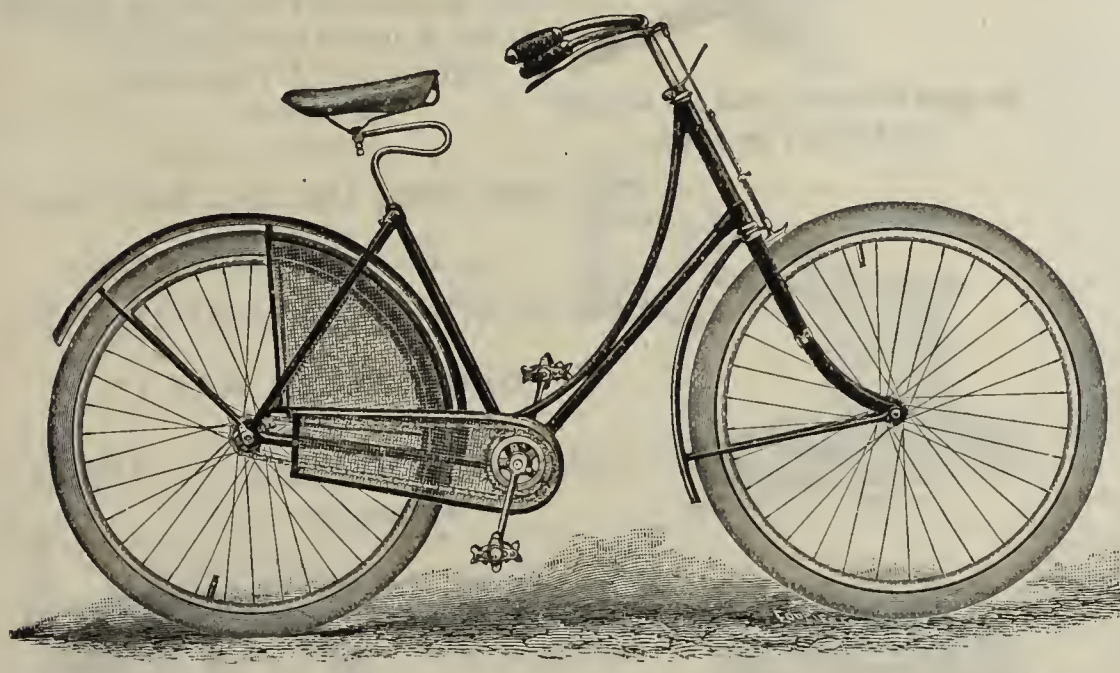
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Full Ball Bearings. Throughout.

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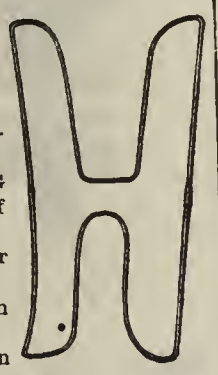
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THE Covert "Pants Stretcher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

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Write for catalogue.

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— "AND you went up the Rhine, I suppose?" said Mrs. Malaprop. "Indeed, yes; it was beautiful." "And did you see any rhineoceroses?"—*Tit-Bits.*

— WHAT KILLED THE PARROT.—The man was walking along Lenox avenue carrying a parrot in a cage.

"What you got there?" asked a friend.

"Parrot; I'm taking it home to my wife. She always wanted one."

"I hope you'll have better luck than I did with one I gave my wife."

"What happened to it?"

"Don't know my wife, do you?"

"No."

"Neither did the parrot. It wanted to talk during the daytime and couldn't get a chance while my wife was around, so it stayed awake at night to do its talking, and the poor thing died of insomnia before two weeks."—*Exchange.*

— THE PREVAILING IDEA. — "Dear me!" exclaimed the indignant woman passenger, whose dress had been walked all over by the gentleman who got on the train at Plunkville, "you must have left your manners at home."

"Yas," he cheerfully answered, "I did. I'm goin' to Chicago, an' fum what I hear of the place I 'lowed they wouldn't be no need fer 'em."—*Indianapolis Journal.*



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"So the tall buildings do swing back and forth?" he was asked.

"Certainly, but don't be afraid; they'll not break."

— "You may speak," said a fond mother, "about people having strength of mind; but when it comes to strength of don't mind, my son William surpasses any one I ever knew."—*Tid Bits.*

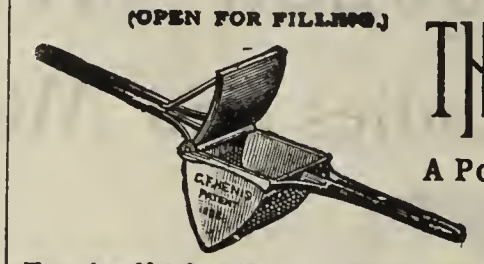
— TOUGH.—"It's hard luck," said the old man. "I sent a substitute to the war, paid him $150 and, by thunder! if he didn't distinguish himself, get himself on the pension rolls for $100 a month and now he refuses to pay me a commission."—*Truth.*

— THE TEST.—"So the engagement is broken?"

"Yes."

"What was the reason?"

"It was a case of love at first sight. They're acquainted with each other now."—*The Press.*



No other Kitchen Utensil can be used for so many purposes.



(HOW IT OPERATES.)

THE HENIS Fruit Press and Vegetable Strainer.

A Potato Masher, A Fruit Press, A Jelly Press, A Disintegrater, A Colander, and A Vegetable Strainer,

COMBINED IN ONE

Small, Strong, Light, Cheap, Handy Utensil.

ALWAYS READY. EASILY CLEANED.

A HOUSEHOLD NECESSITY

YOUR DEALER HAS IT.

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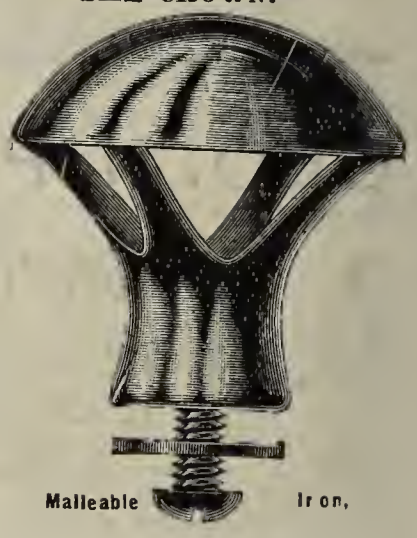
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Manufacturer of
MALLEABLE IRON
TURN-KEYS, SHAKERS,
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SHOULD BE USED ON EVERY

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as they hold the heat back, retaining it just where it is wanted, with no smoke or gas in the room, saving 25 per cent in fuel.

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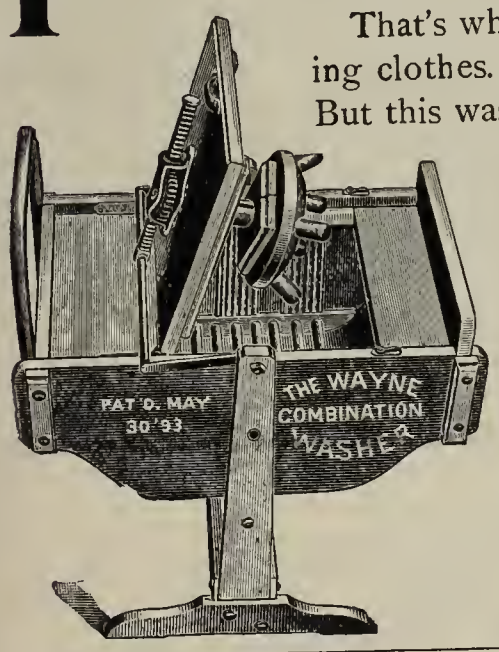
WE MAKE the strongest, most substantial and most handsomely ornamented Flour Bin on the market. It is supplied with our patent **detachable shield,** which keeps the weight off and the crank from clogging. It also has our patented sleeve, which protects the flour from coming in contact with the iron crank. It has many other valuable features. We are daily receiving inquiries from consumers in places where our bins are not handled by dealers. You can have this trade if you want it, by carrying a small stock of our bins. With orders for one dozen or over we furnish 500 of our handsome booklets with your name and address, thus giving you some of the best free advertising you ever had. Very respectfully,

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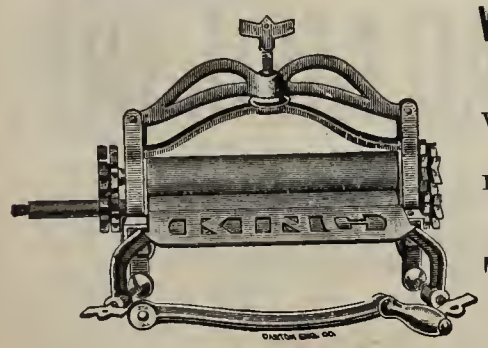
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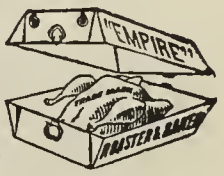
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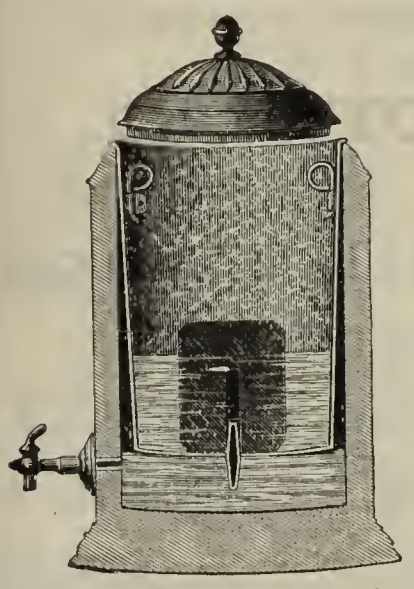
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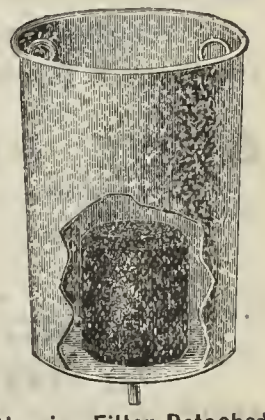
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Filter Cylinders Only, Fitted with Carbons.

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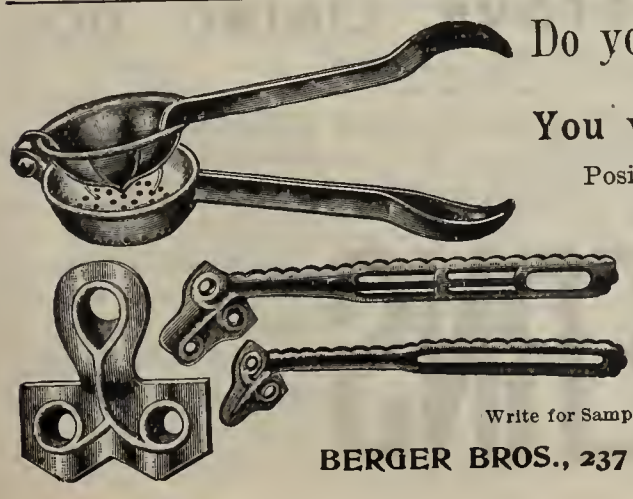
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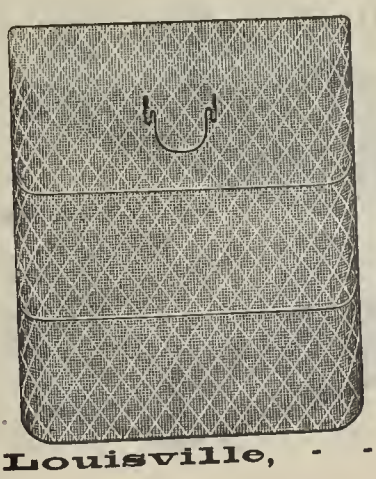
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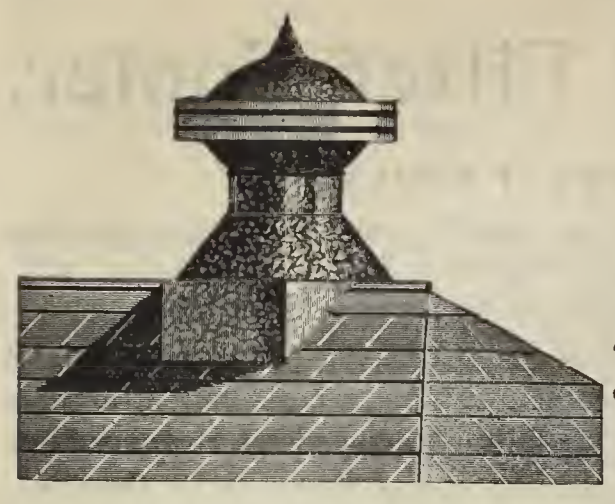
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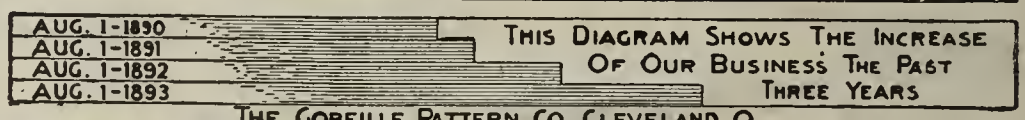
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There was once a tiny grain of sand that had lain quietly for years on the tar and gravel roof of a big building.

One day a brisk breeze came along and said to the grain of sand:

"Why don't you go out into thegreat world and get acquainted with the people? Nobody ever heard of you here. Come along and let us have a good time."

But the tiny grain of sand shrunk back and said:

"I am such a little thing I should get lost. I would rather stay here."'

"Your modesty does you credit," rejoined the brisk breeze, "but modesty does not pay in this age of the world. Come along!"

It was so urgent about it that the little grain of sand got up and went along with it.

And the brisk breeze carried it gleefully out over the cornice and down the street and round the corner and into the eye of a dignified citizen who was climbing into his carriage.

And the dignified citizen took out his handkerchief and rubbed his eye hard, and the terrified little grain of sand crept up between the lid and the eyeball until it found a spot it could crawl into, and it put itself right there.

And all the rest of that day the dignified citizen rubbed his eye and groaned, and he lay awake all night and groaned, and the next day he went to an oculist.

And the oculist hunted all over his eye and scraped it and said it was a serious case, and scraped it some more and hunted all over the eye again, and at last he found the little grain of sand in its snug hiding place and pried it out and charged the dignified citizen $25.

And the dignified citizen took the tiny grain of sand home with him and glued it to a piece of white card board and put it in a gilt frame and hung it up on the wall in his library, and he goes in there every day and looks at the tiny grain of sand and swears at it.

Never think you are of no consequence, dear children, beeause you happen to be little.—*Chicago Tribune.*

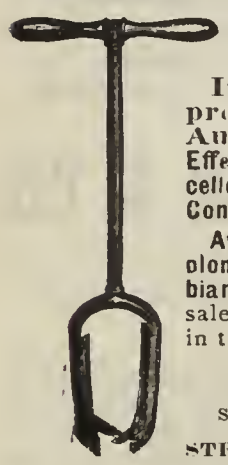
—A GERMAN urged an Englishman to go shooting with him. "Oh," said the Englishman, haughtily, "I do not care for hunting unless it contains the element of danger."

"Well, then you shust go mit me," replied the German: "only de oder day I shoots my brudder-in-law in de sthomag."
—*The Southern Exchange.*

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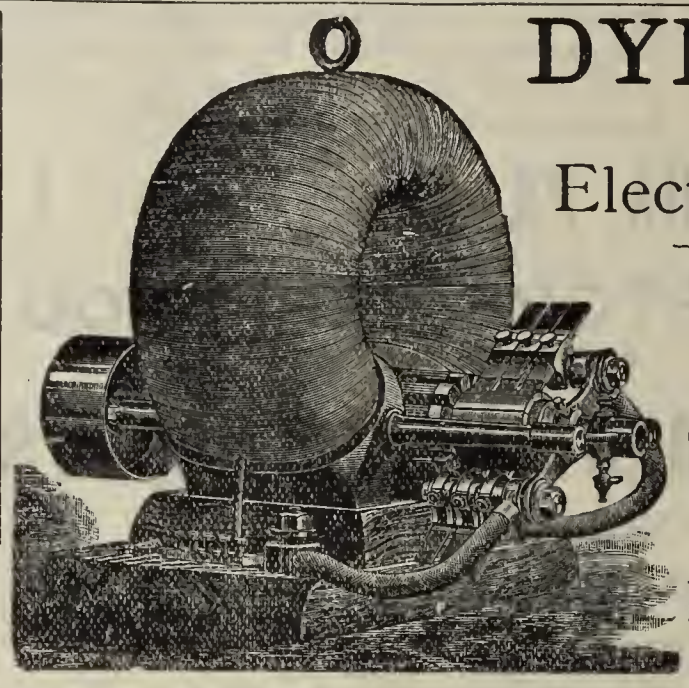
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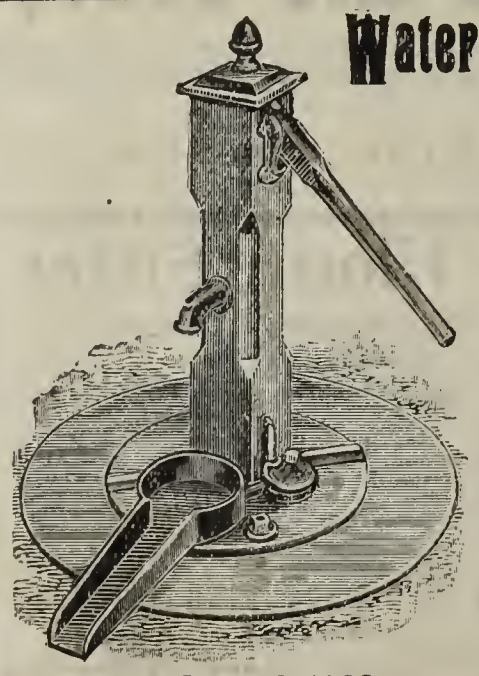
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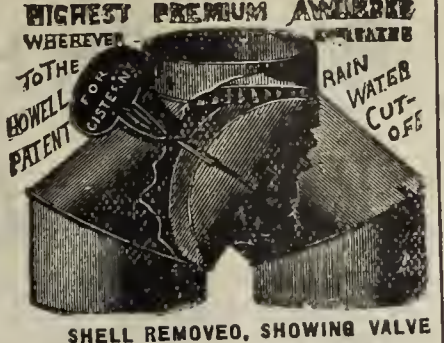


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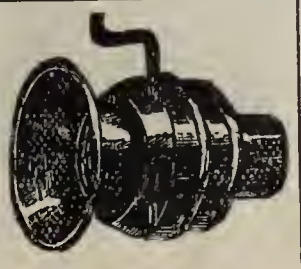
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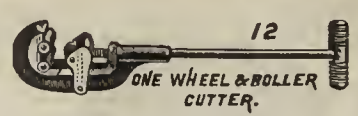
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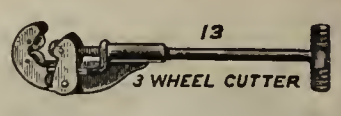
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HAND



PIPE



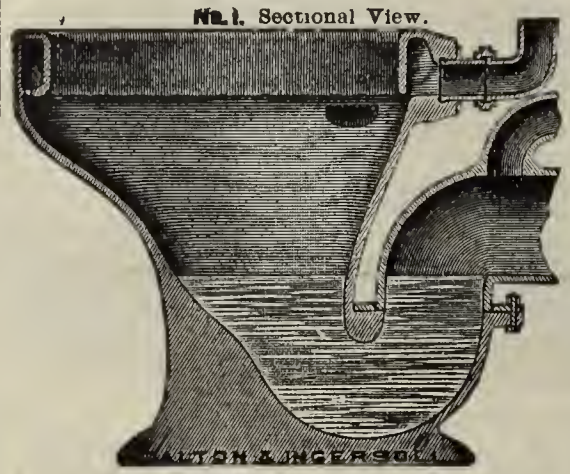
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(TRADE-MARK.)



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The bowl contains a pool of water 7 x 6 inches. This is a much larger pool of water than has ever been obtained heretofore in the Short Hopper principle; and until now it has been considered an impossibility to construct a Short Hopper with a large standing pool of water that would discharge its contents. This we do in the *Boston Hopper* with the same amount of water that is required to flush an ordinary Short Hopper.

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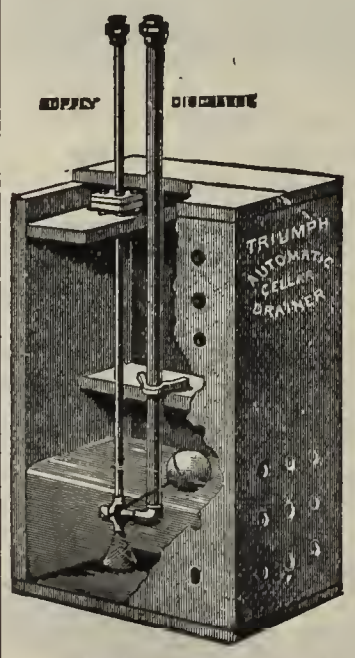
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Pat. May 19, '85. Pat. May 26, '85. Pat. July 14, '85. Pat. Aug. 8, '86. Pat. Nov. 23, '86.

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*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

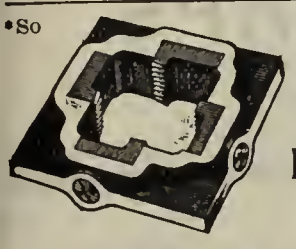
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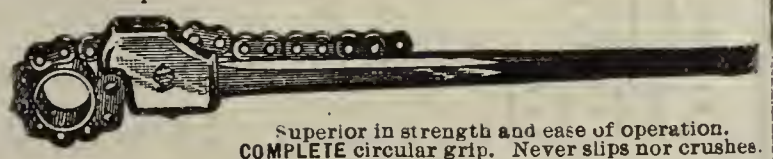
TRIMO PIPE WRENCH,

Forged Steel.

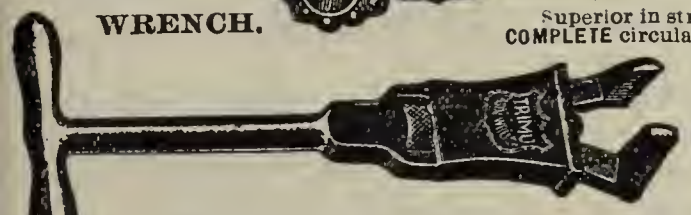
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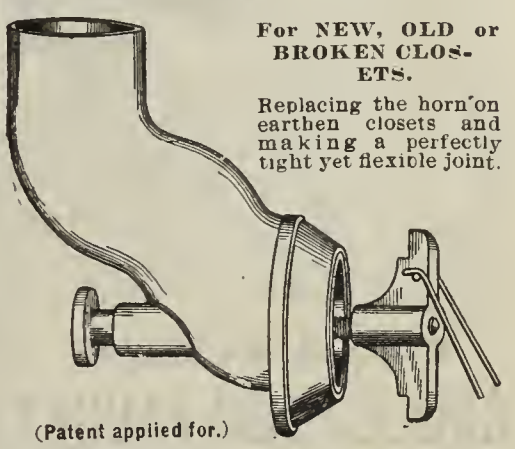


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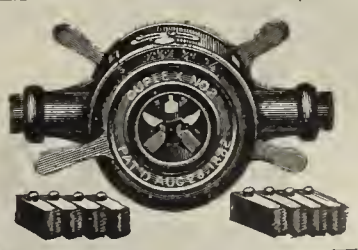
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CLARK'S ANGLE PLUG FAUCET

For Family Oil Cans, Etc.

(Patent applied for.)

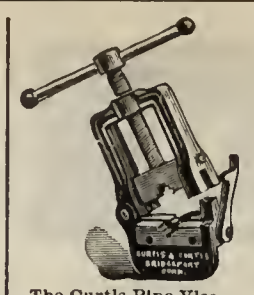


The Faucet is constructed with a Plug set on an angle, making it very convenient, and has a double running thread. The liquid has a direct flow, which obviates oozing out through the threads; in fact, the objectionable points with other styles are overcome.

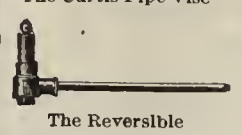
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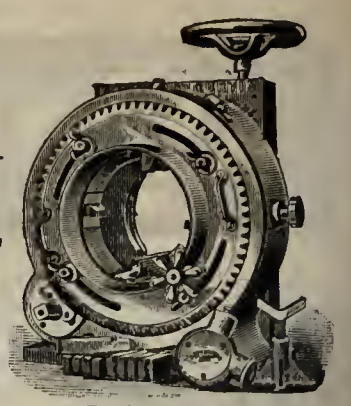
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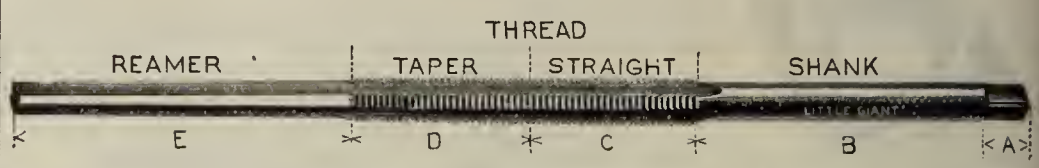


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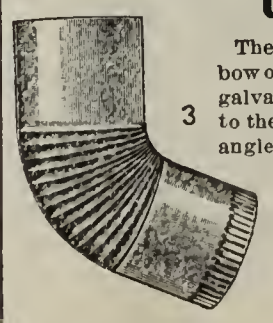
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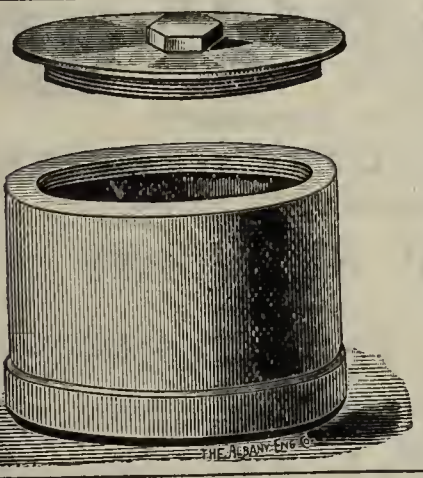
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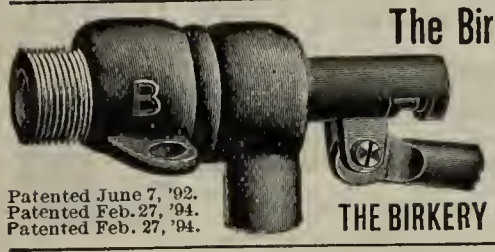
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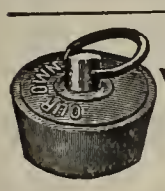
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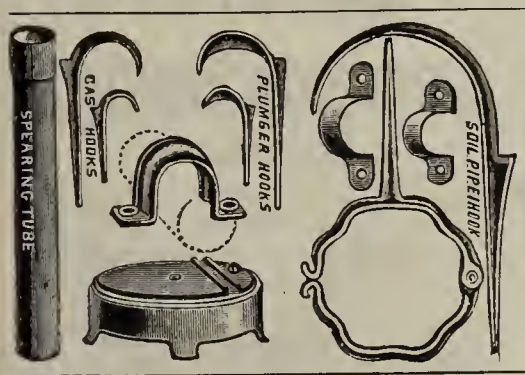
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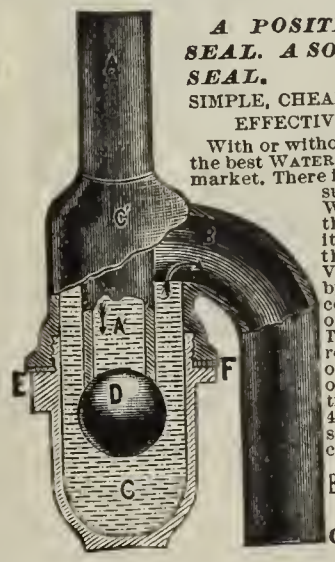
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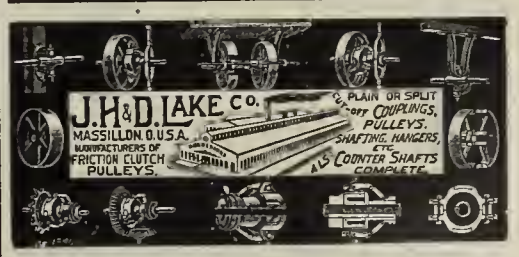
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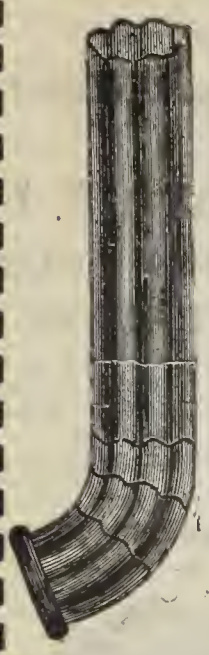


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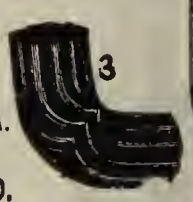
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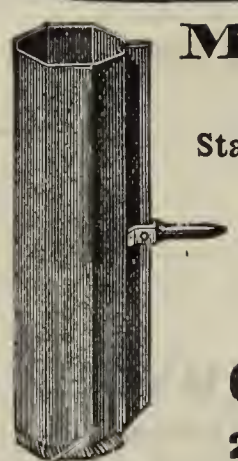
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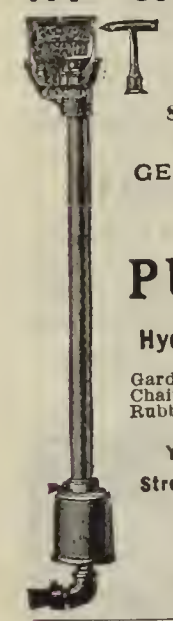
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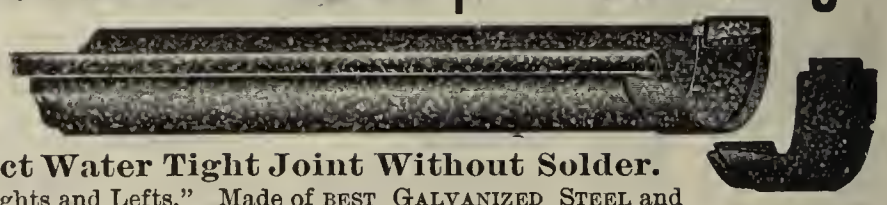


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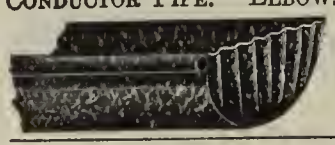
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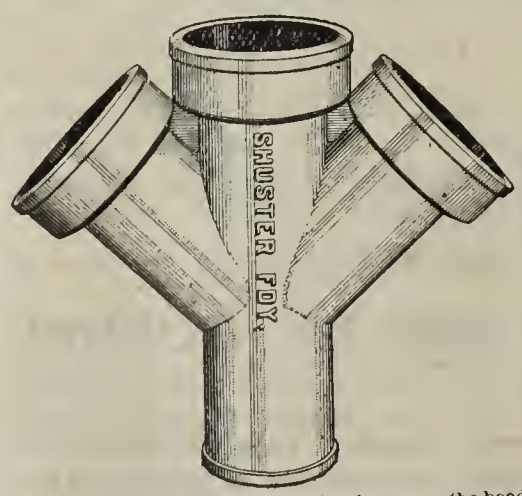
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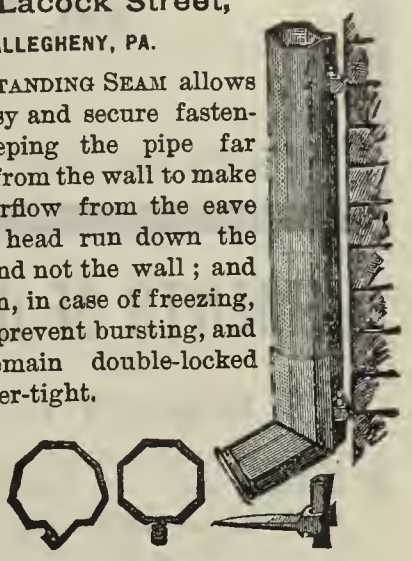
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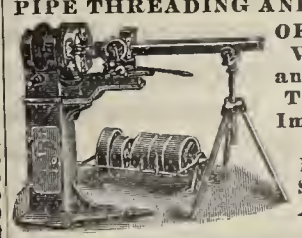


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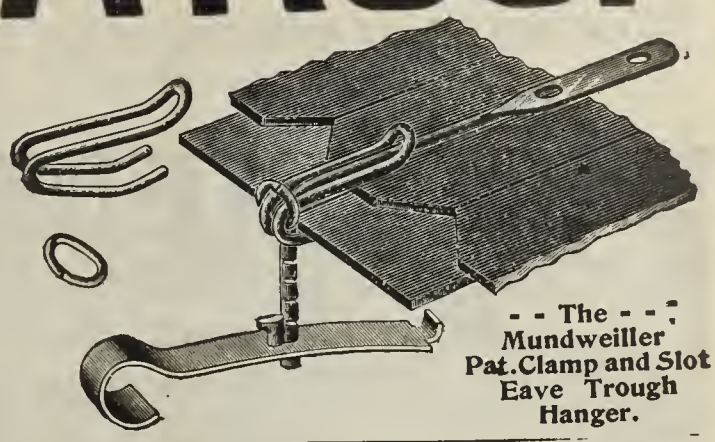
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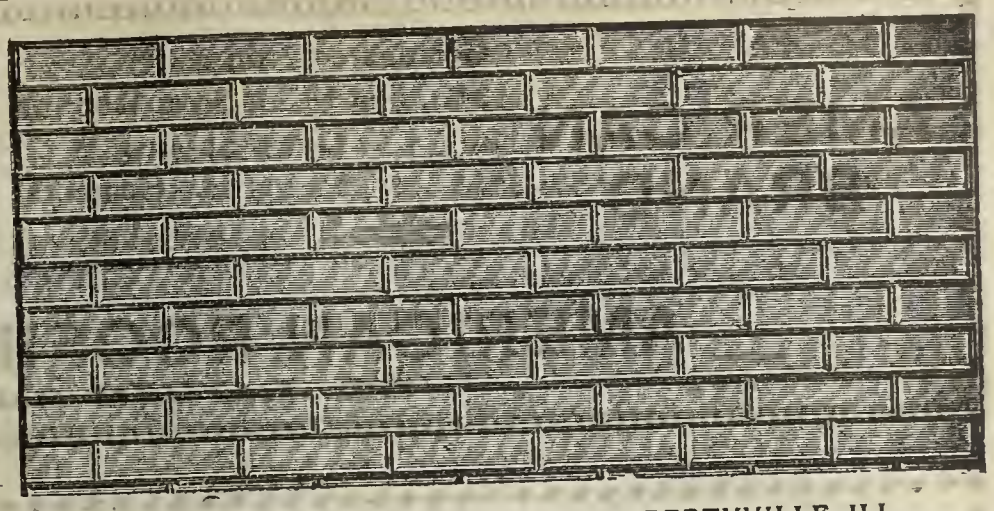
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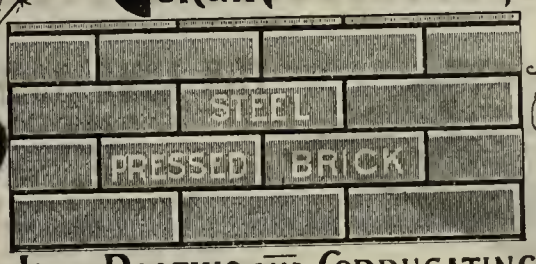
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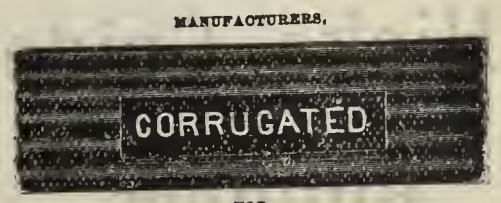
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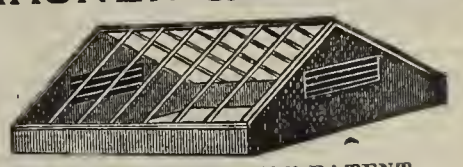
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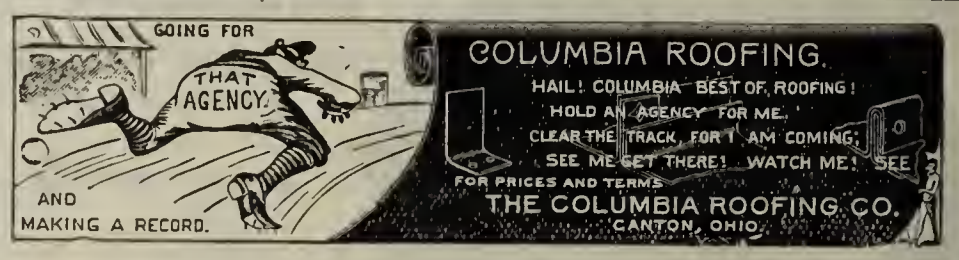
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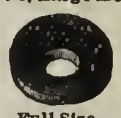
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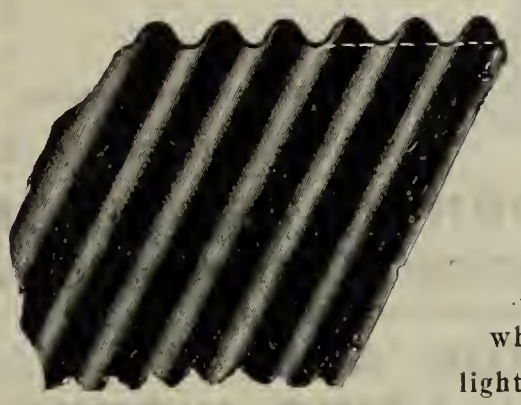
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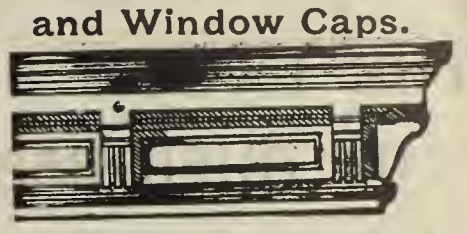
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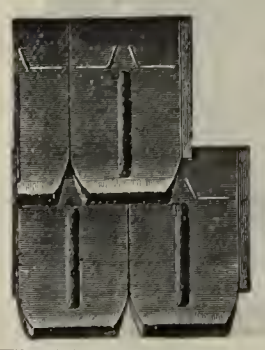


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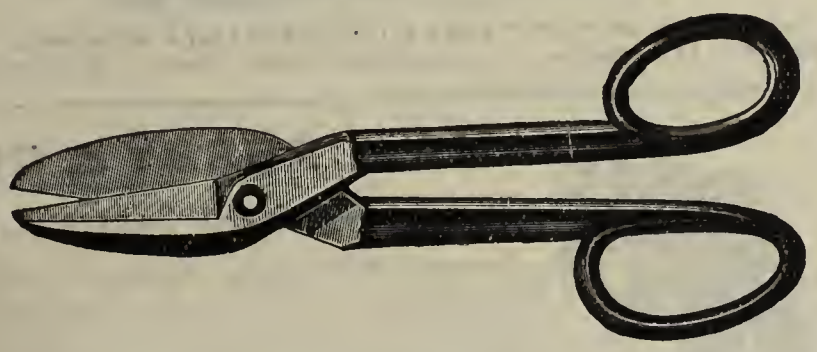
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"No, sir."

"An' that's what you're here for, isn't it?"

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— When Hiram Powers, the American sculptor, had his studio in Washington, he employed his spare time in carving likenesses of the wild animals with which he had grown familiar during his boyhood days among the Green Mountains. It was at this time that he made the figure of the couchant panther which now adorns one of the rocks on the main driveway in Central Park. He was very much interested in this piece of work, and did not like to be interrupted. One day a raw mountaineer from Vermont, who had come to Washington to see the sights, thinking that he must not return without paying a visit to his talented countryman, sauntered into the studio. Mr. Powers paid no heed to him, and did not ask him to sit down, but the Vermonter was not abashed. He not only remained, but he came so close to the sculptor as to interfere with his work. Mr. Powers tried in various ways to intimate that his visitor's room would be vastly better than his company. Still he staid. At last the sculptor called the office boy and bade him sweep. As the studio had not been visited by a broom for a month, the cloud of dust was almost suffocating. The Vermonter choked and coughed, but did not go. He still stood with his gaze riveted upon the piece of stone that was receiving such wonderful grace under the skilled hands of the artist. At last Mr. Powers could stand it no longer. Turning to the countryman he said, with a savage frown:

"My friend, I shall be very much obliged to you if you will put yourself on the other side of that door." The countryman began backing toward the doorway, not once removing his eyes from the panther.

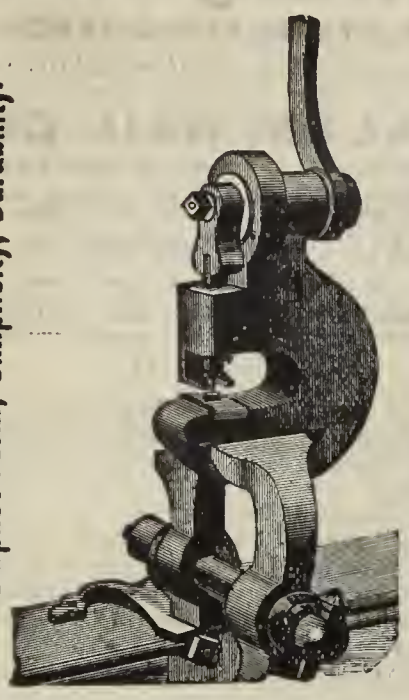
"All right, sir," he said, "I'll go, but—but—geewhittiker, what a spring she's goin' ter make!"

"That," said Powers, "was the most genuine compliment I ever received in my life. What about the man—well, what do you think? I begged his pardon. He furnished me afterward with some of the best models I ever had."—*Exchange.*

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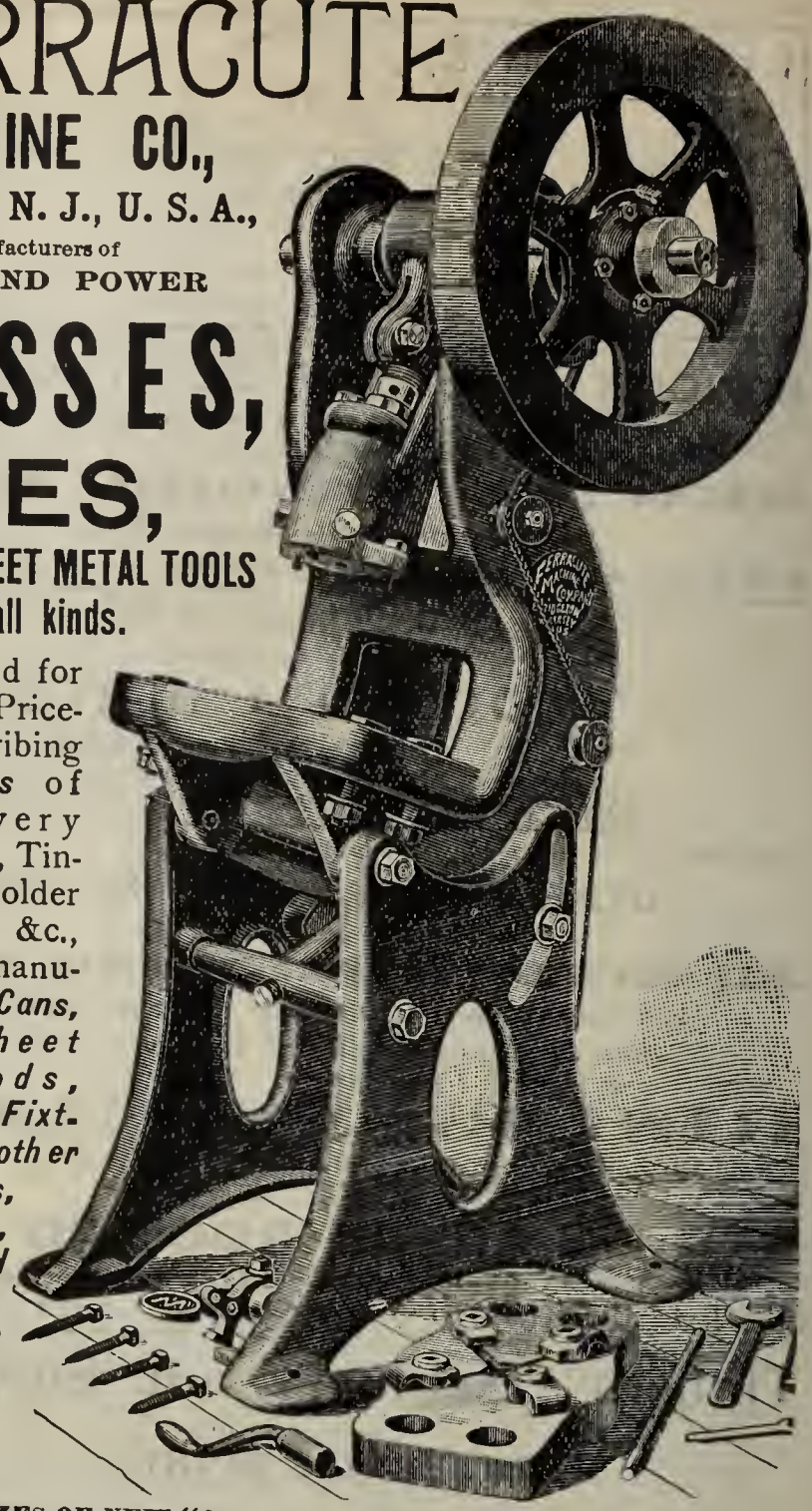
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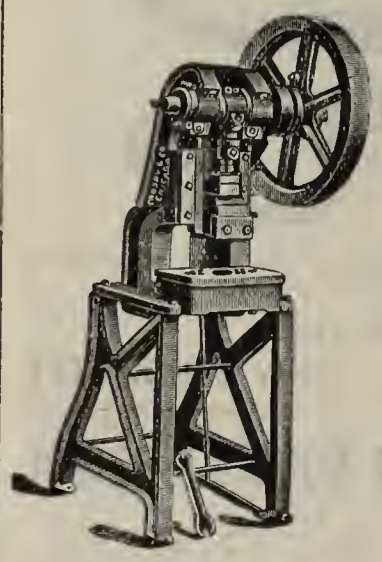
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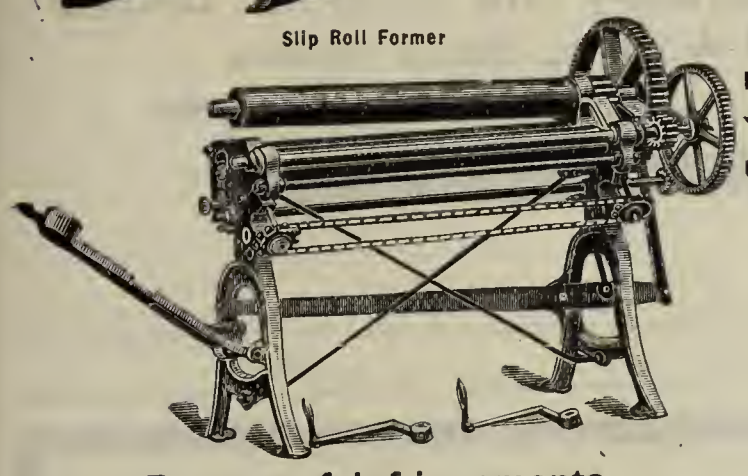
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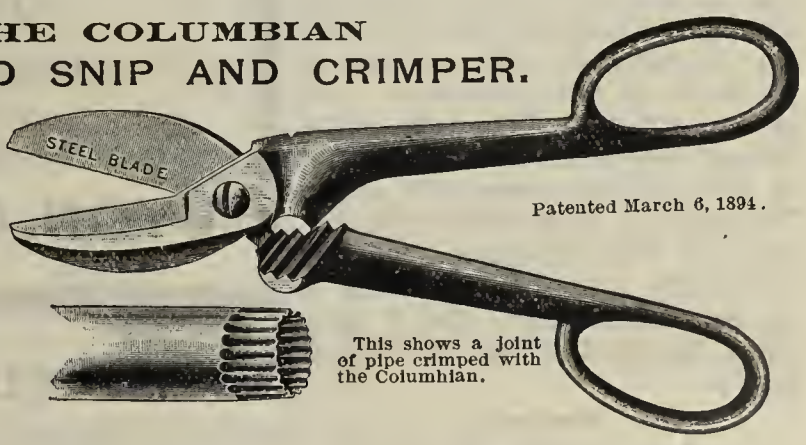
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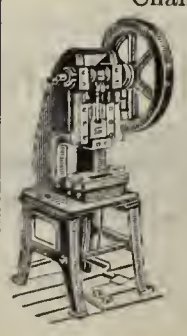
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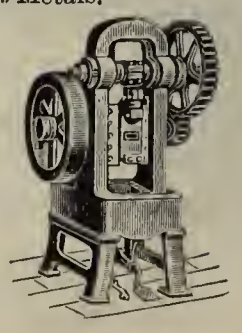
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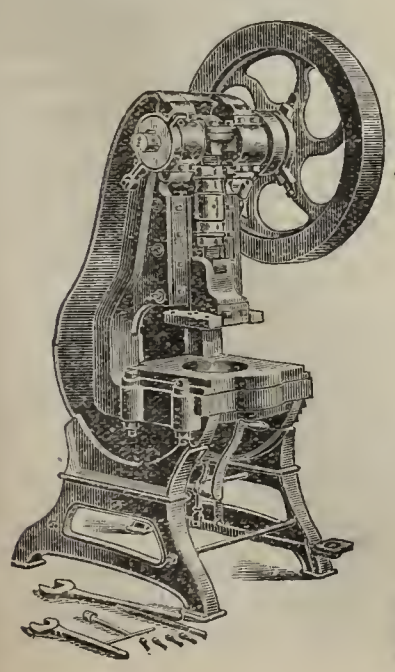


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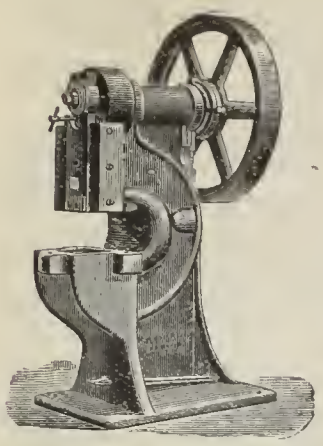
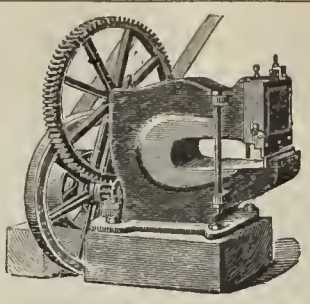
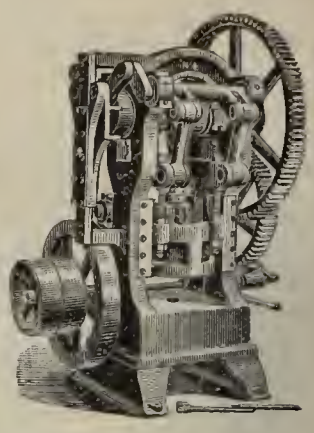
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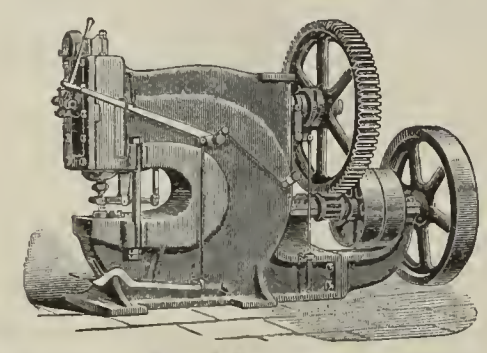
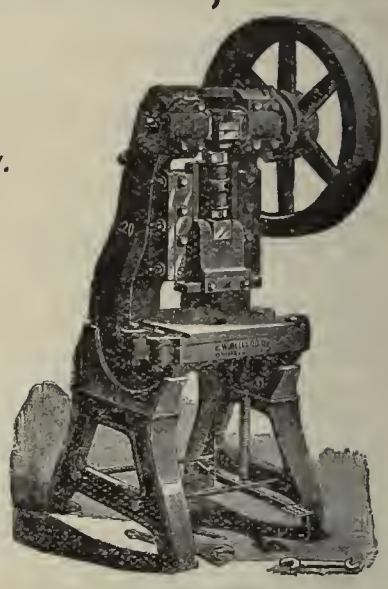




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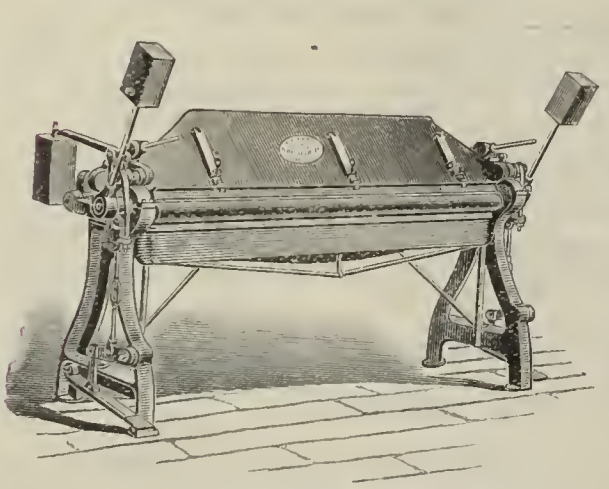
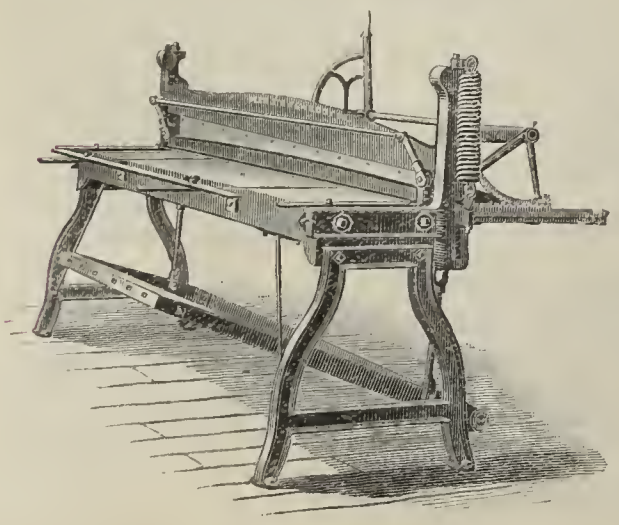




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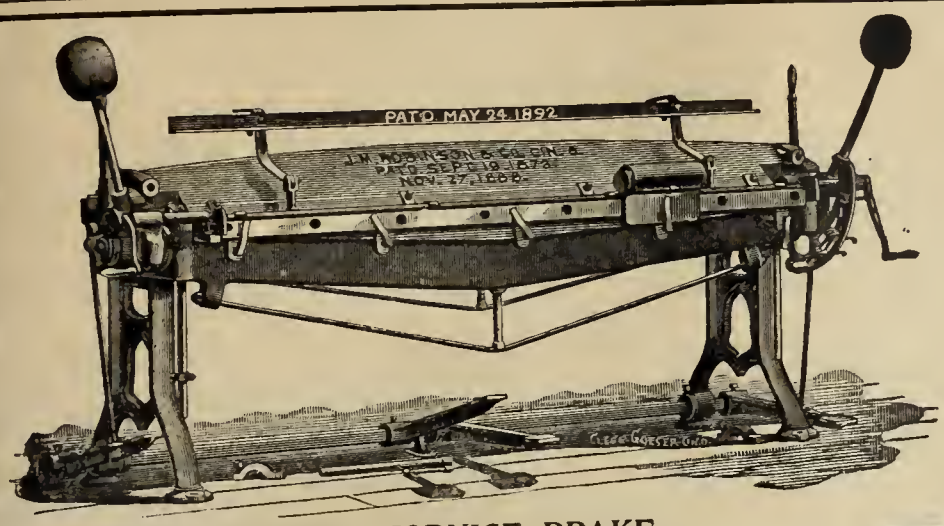
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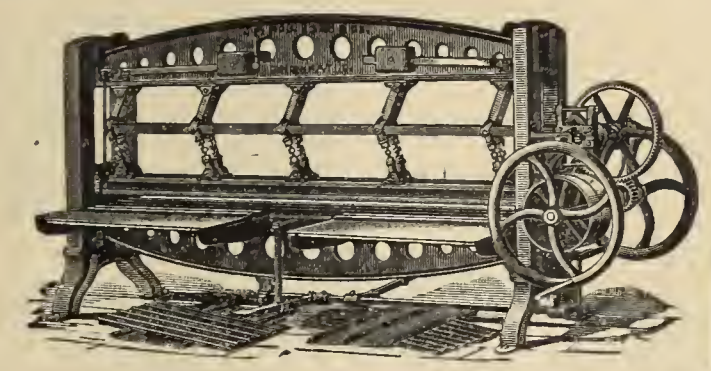


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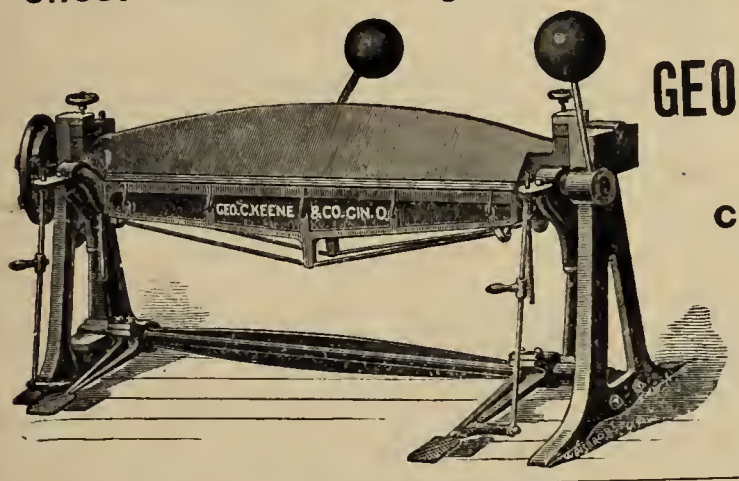
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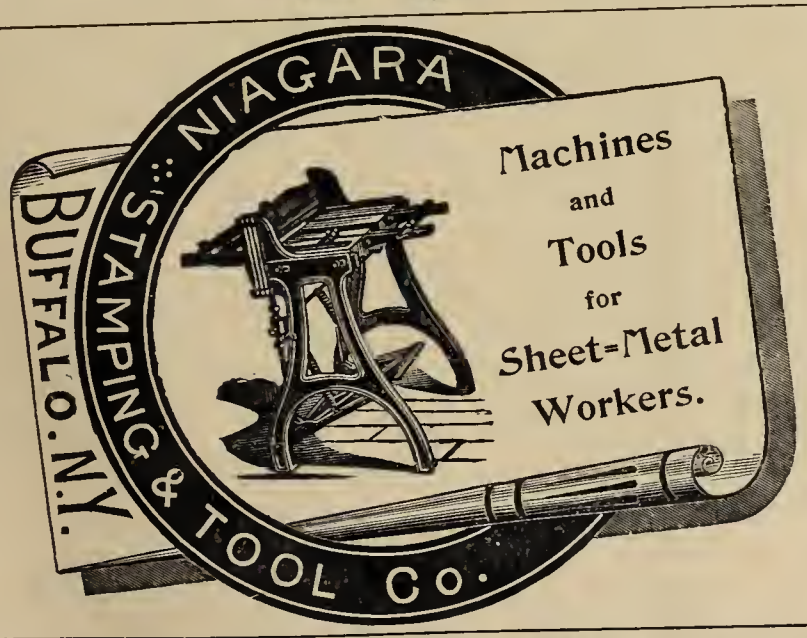
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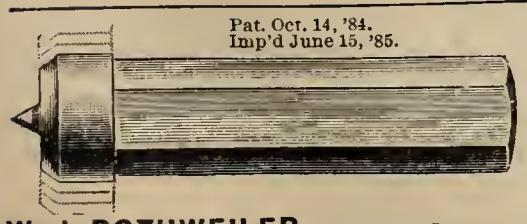
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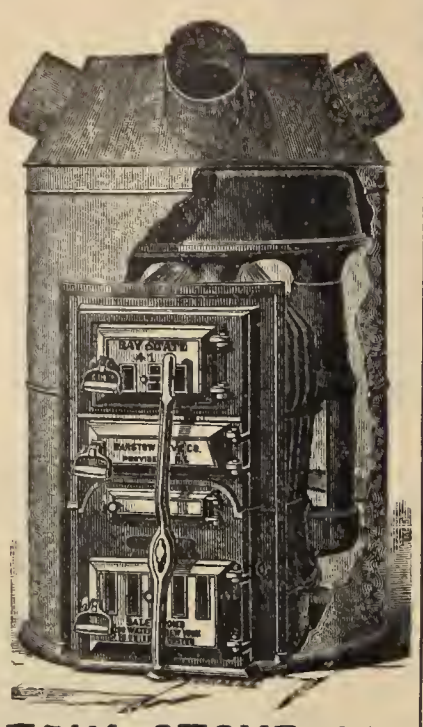
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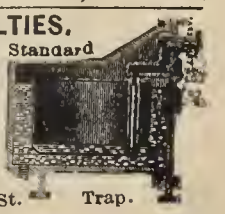
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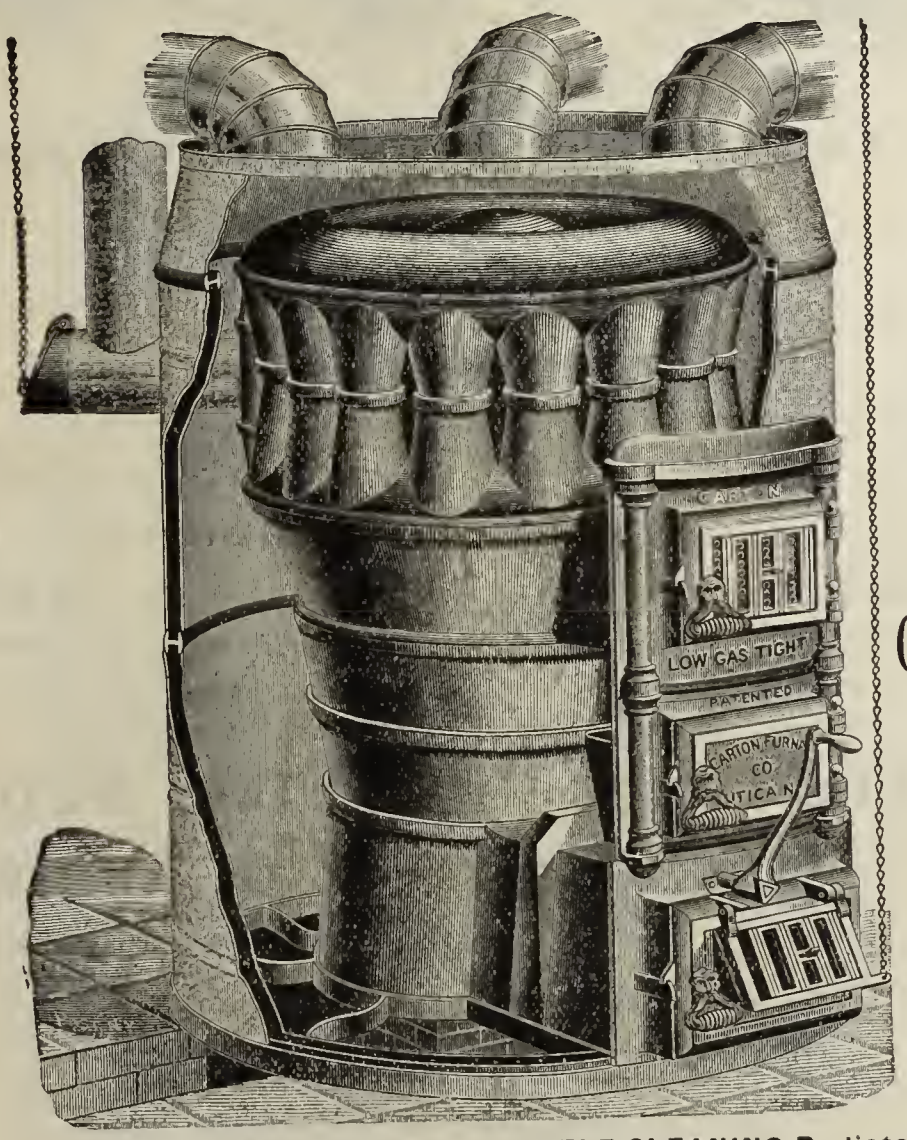
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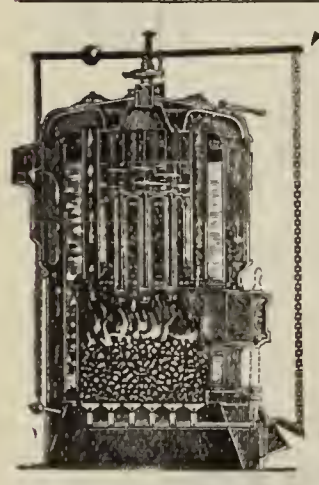
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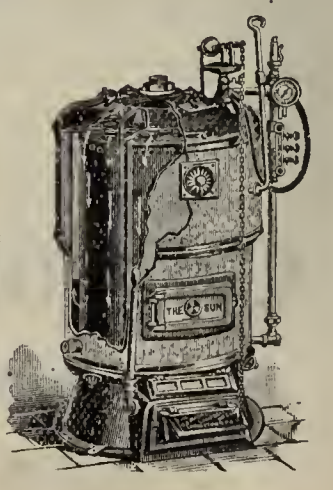
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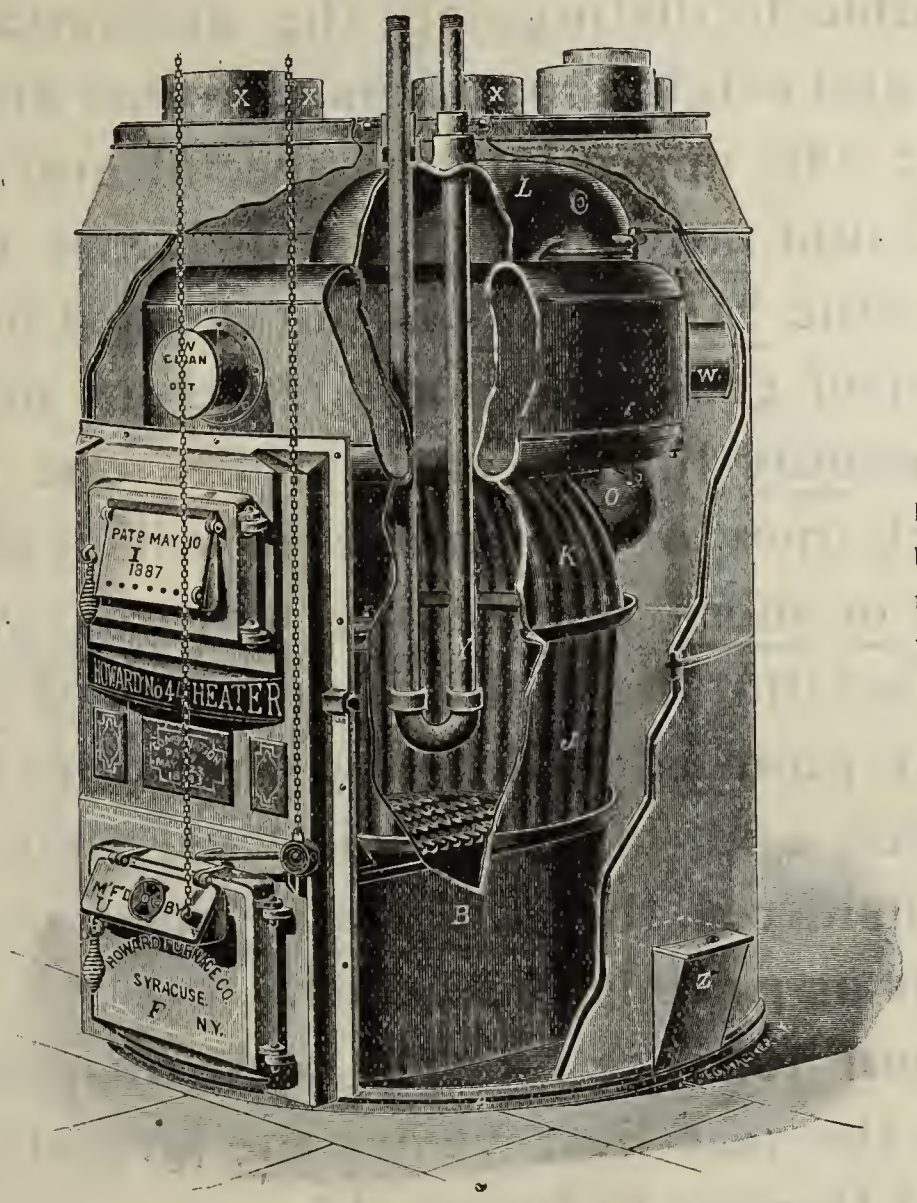
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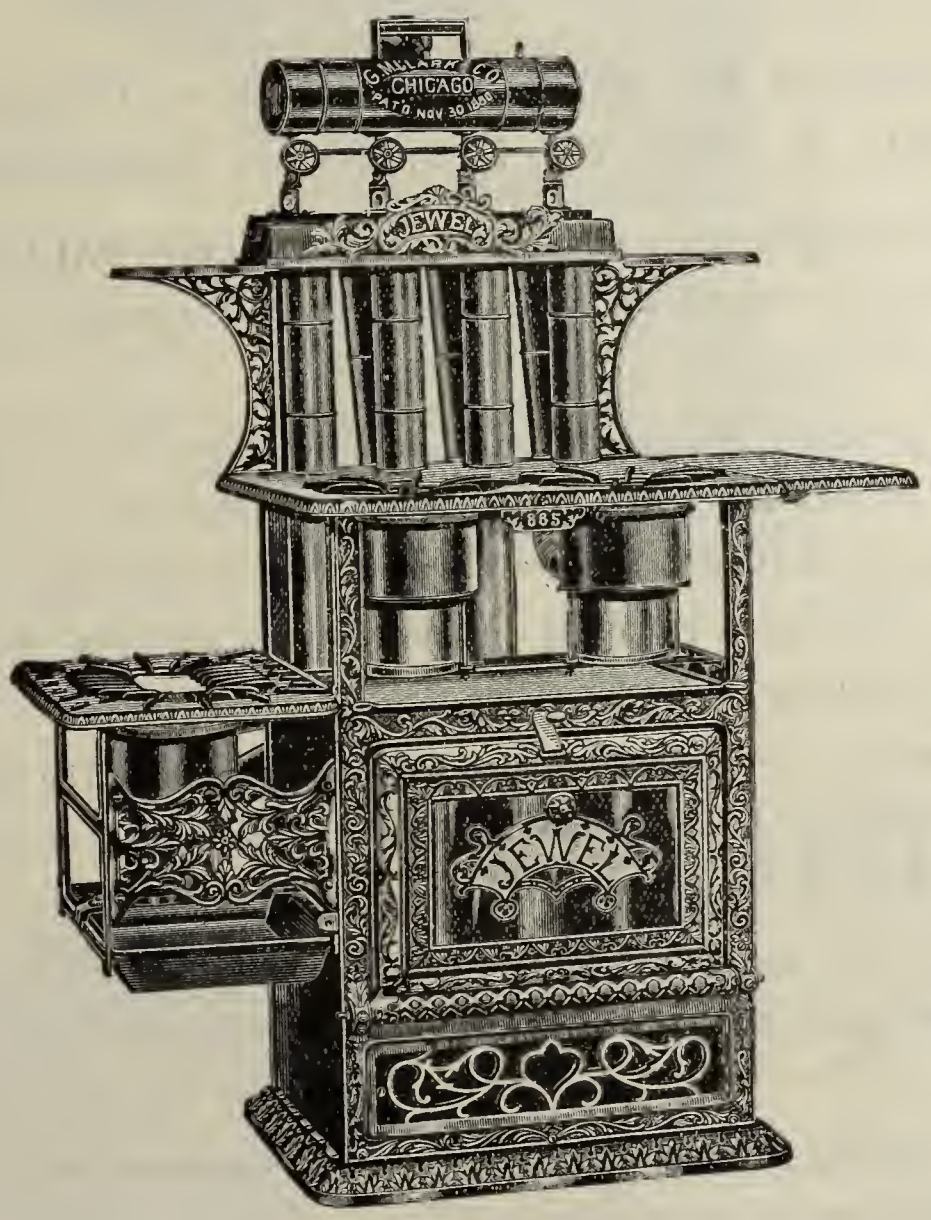
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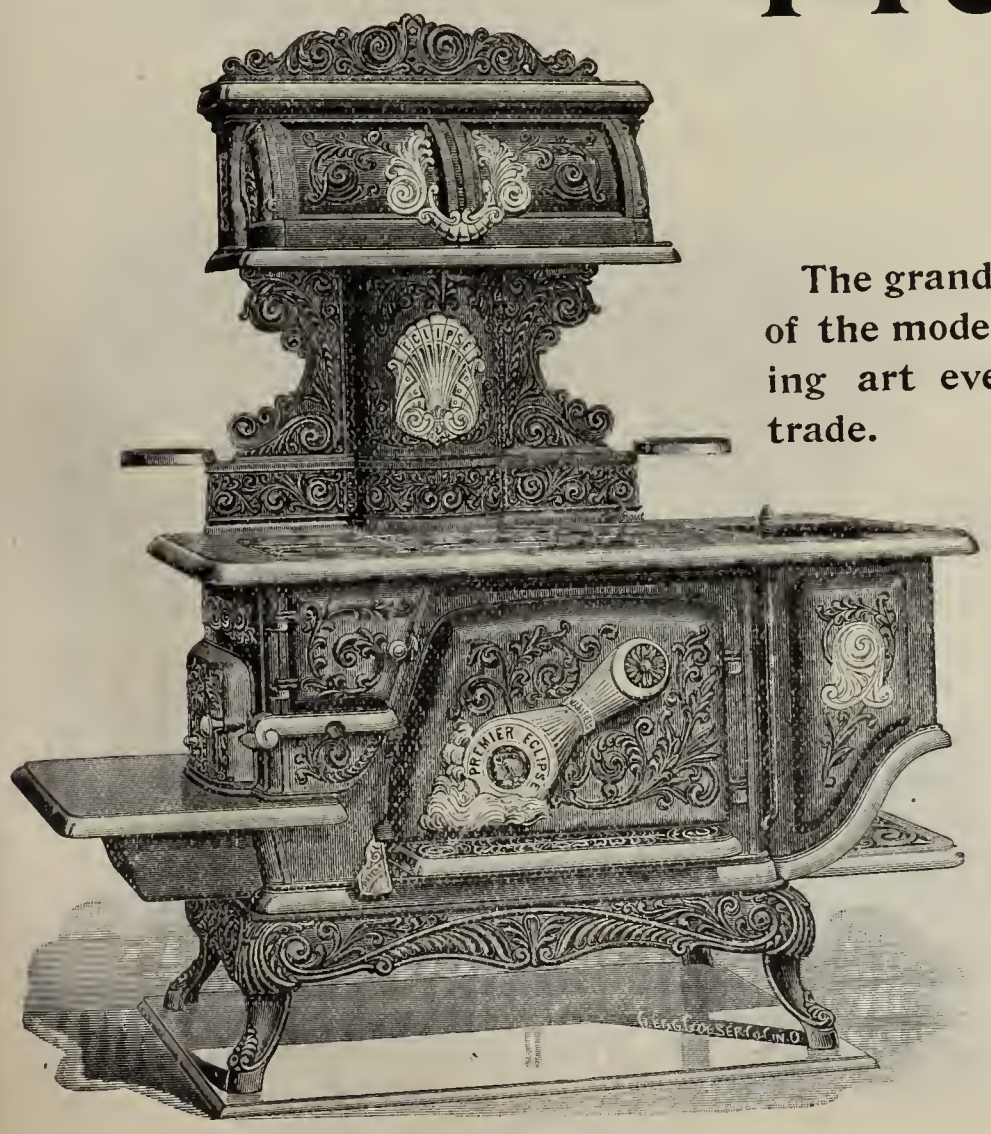
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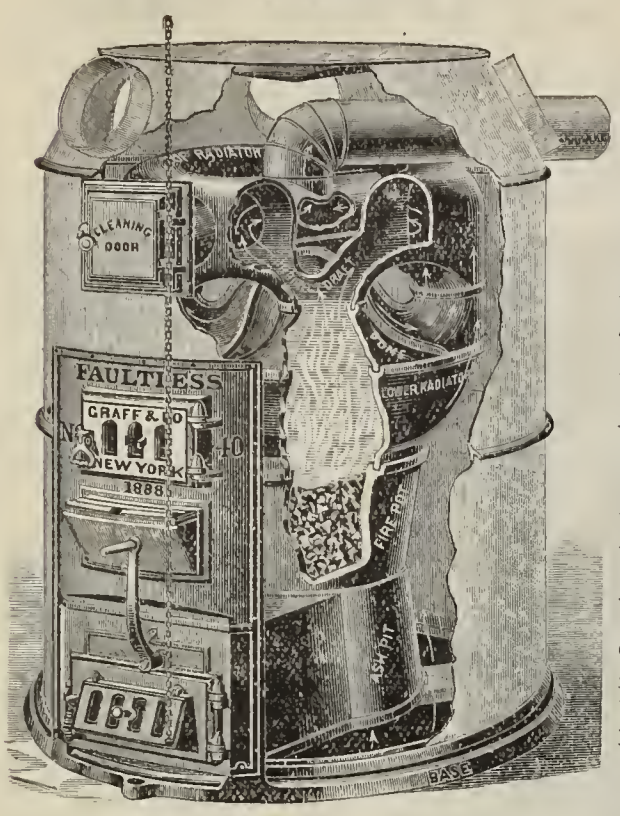
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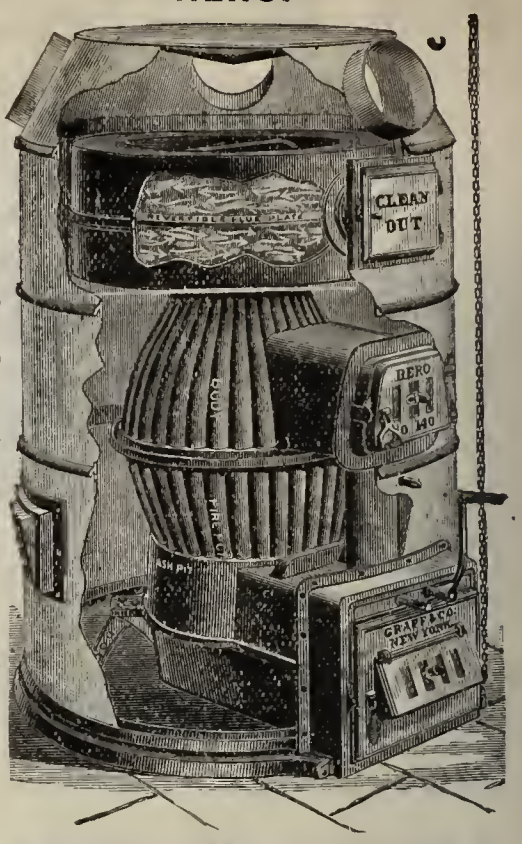
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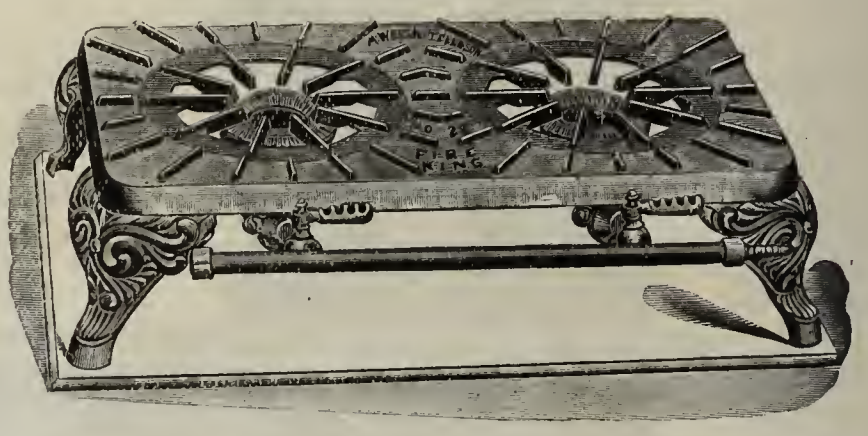
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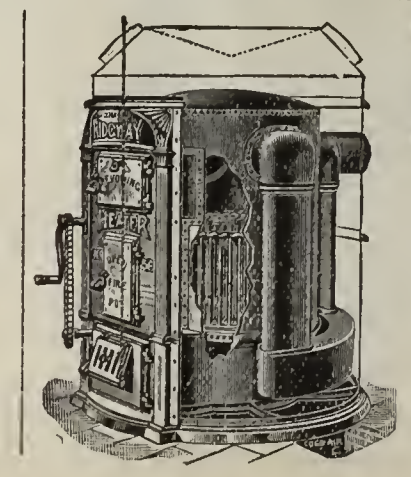


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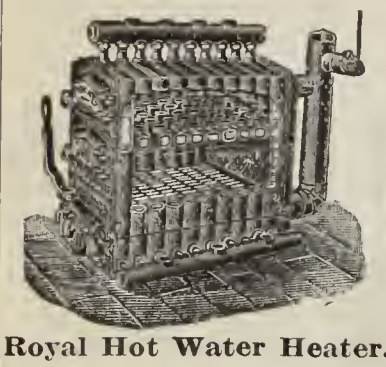
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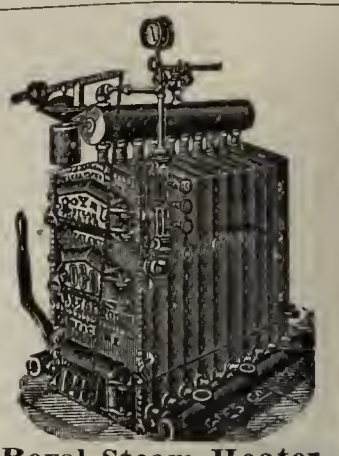
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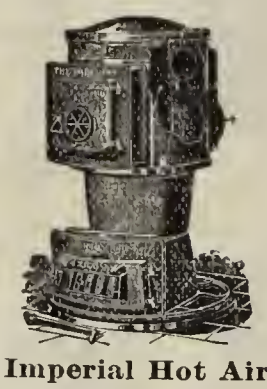
and not on their Antiquity.



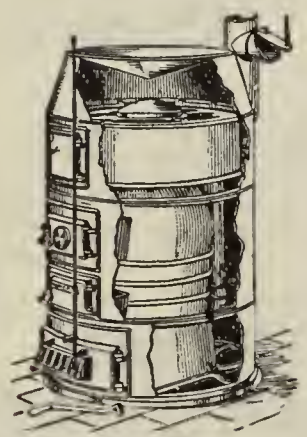
Royal Hot Water Heater.



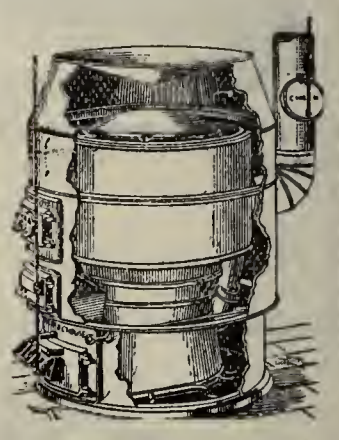
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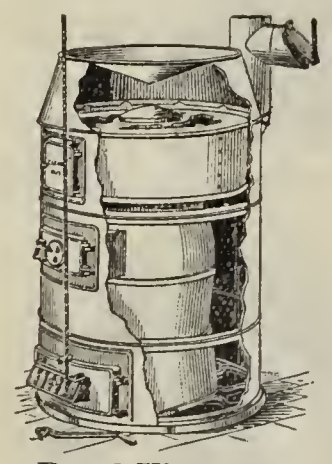


Royal Hot Air Furnace.

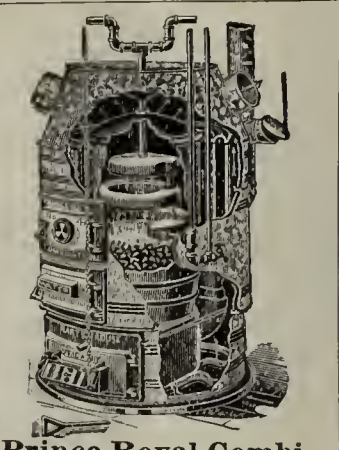


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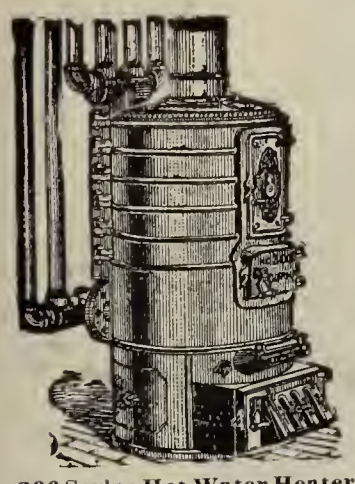
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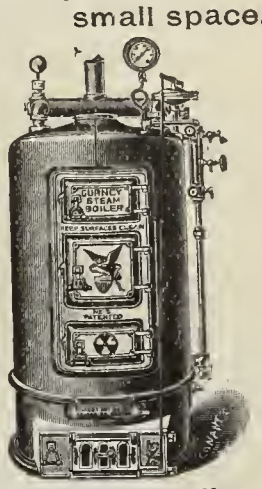
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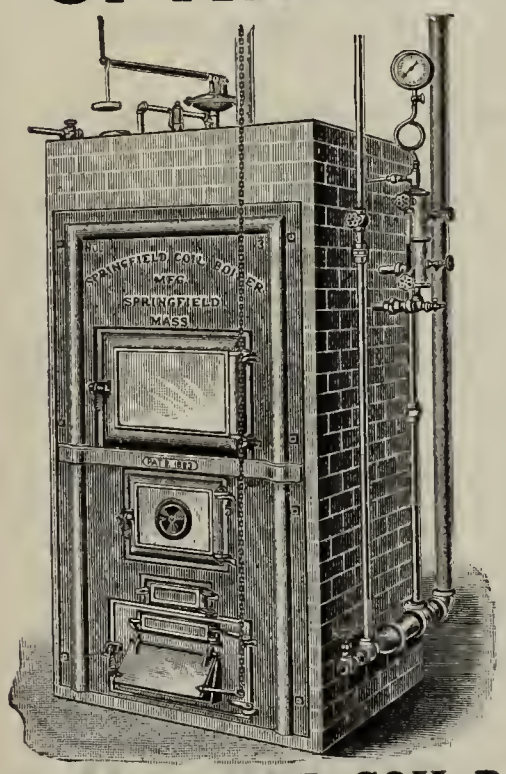
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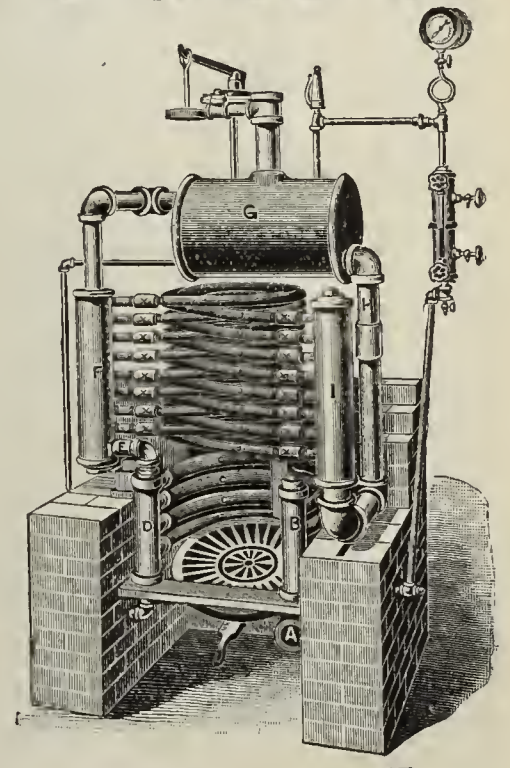


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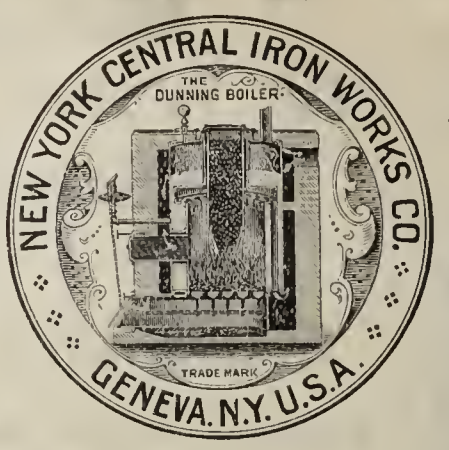
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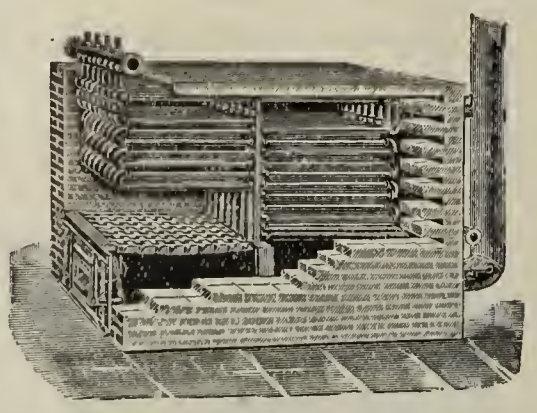
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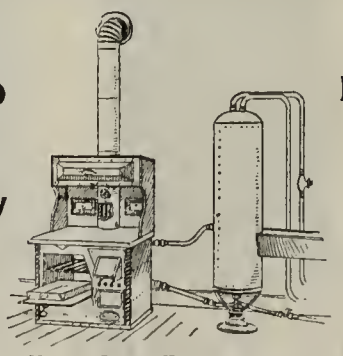


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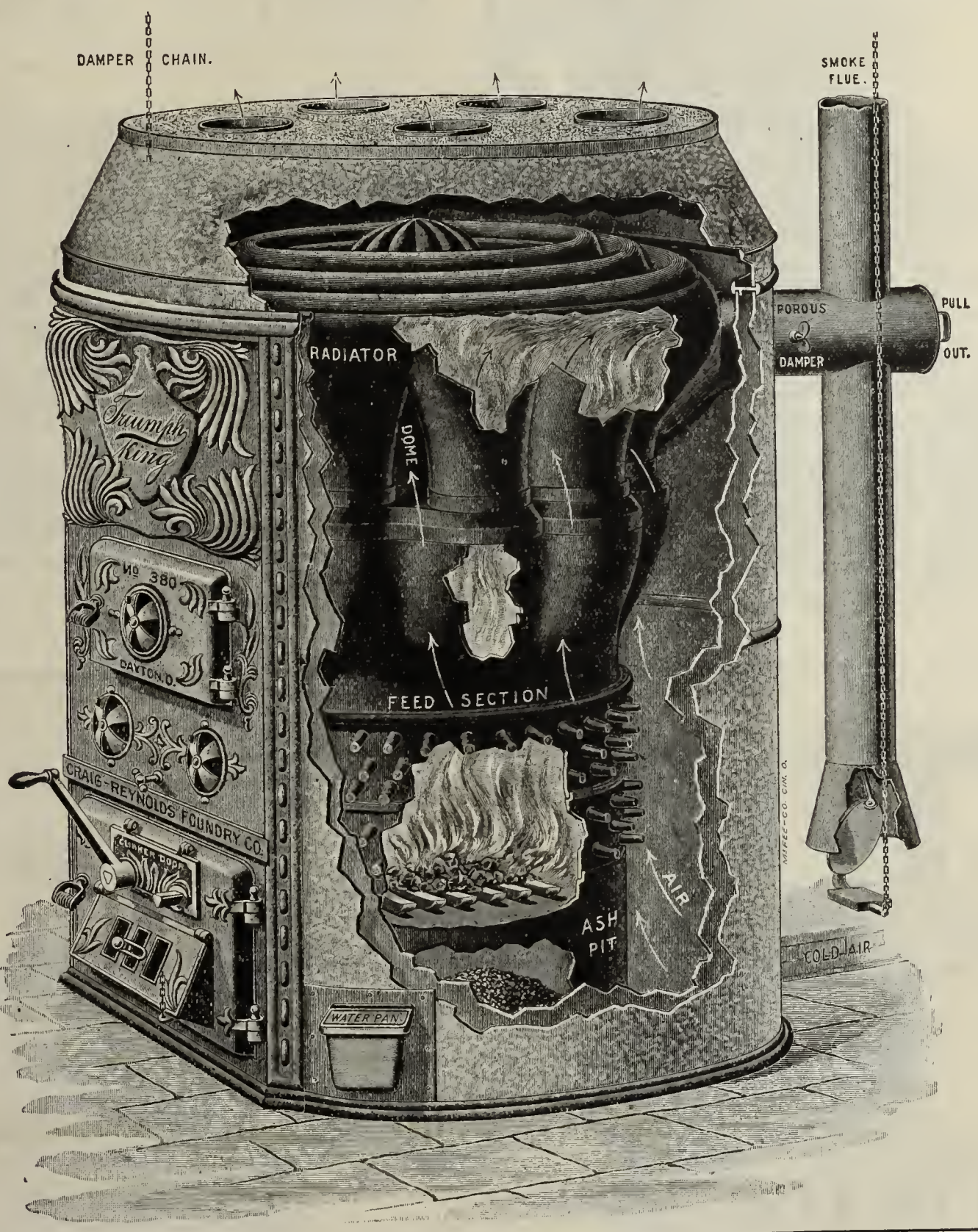
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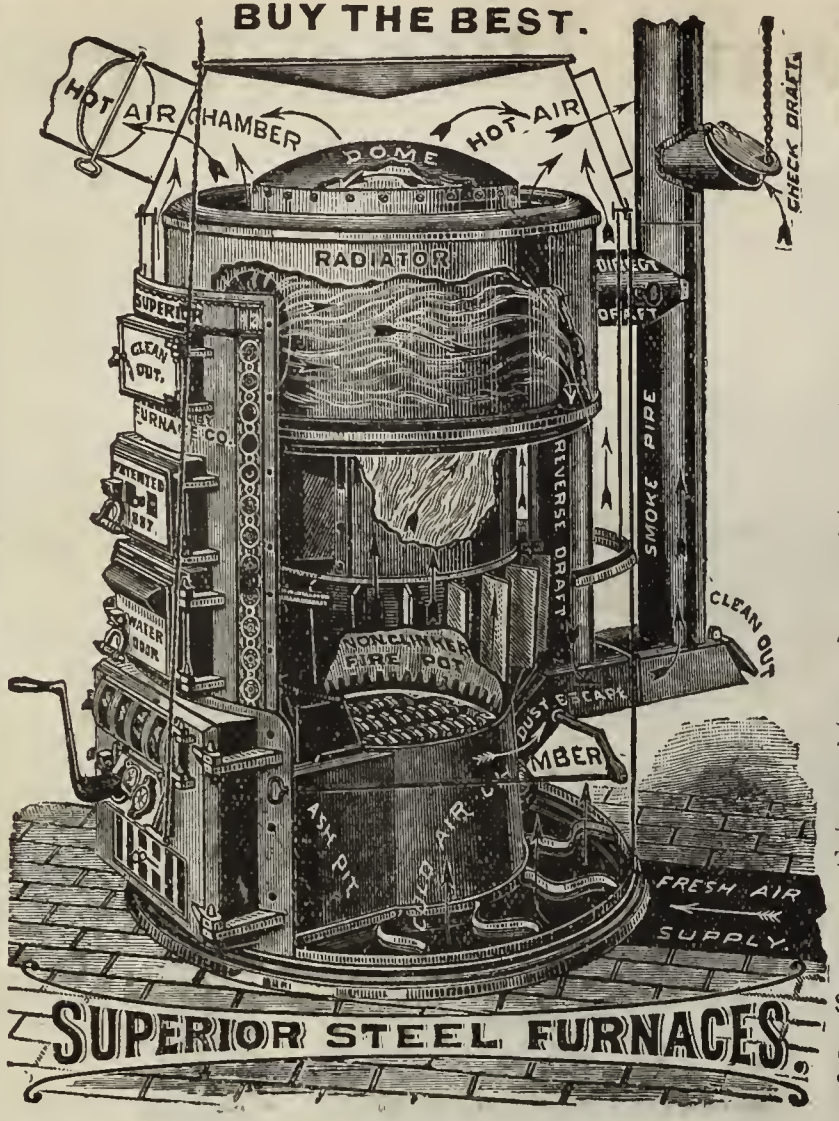
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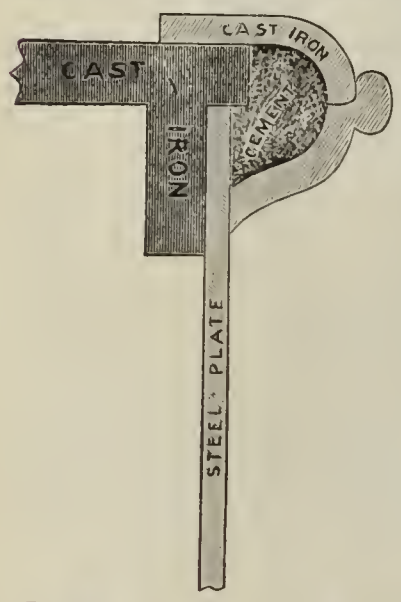
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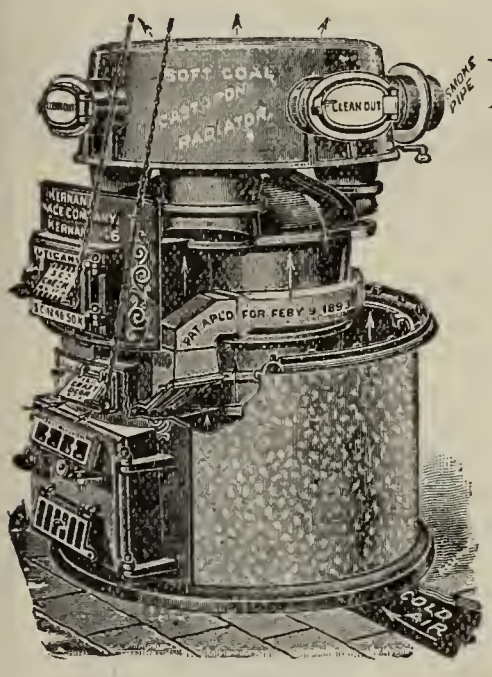
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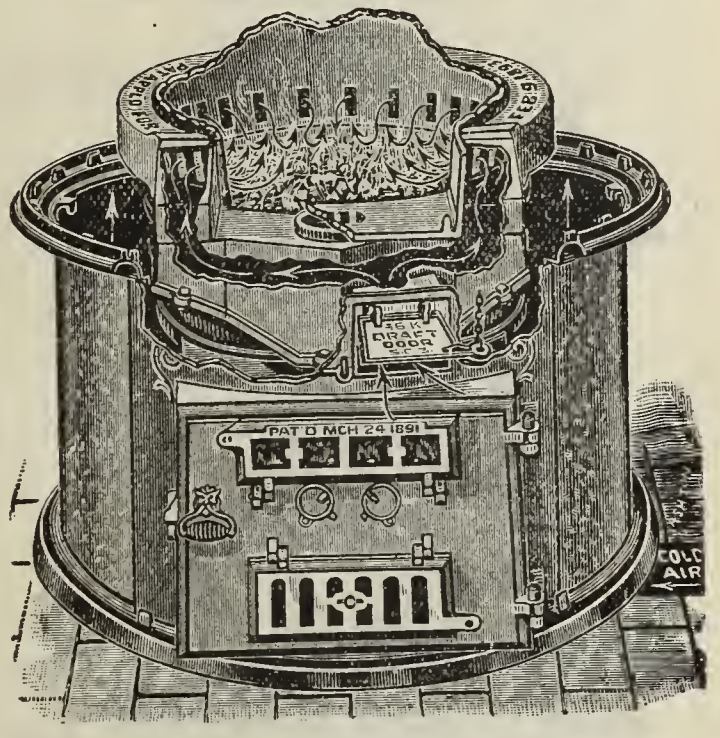
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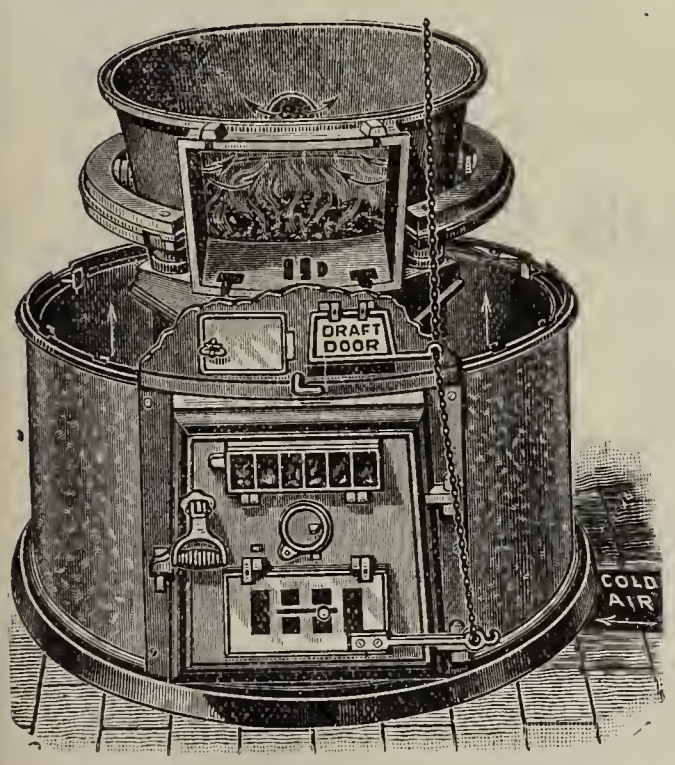


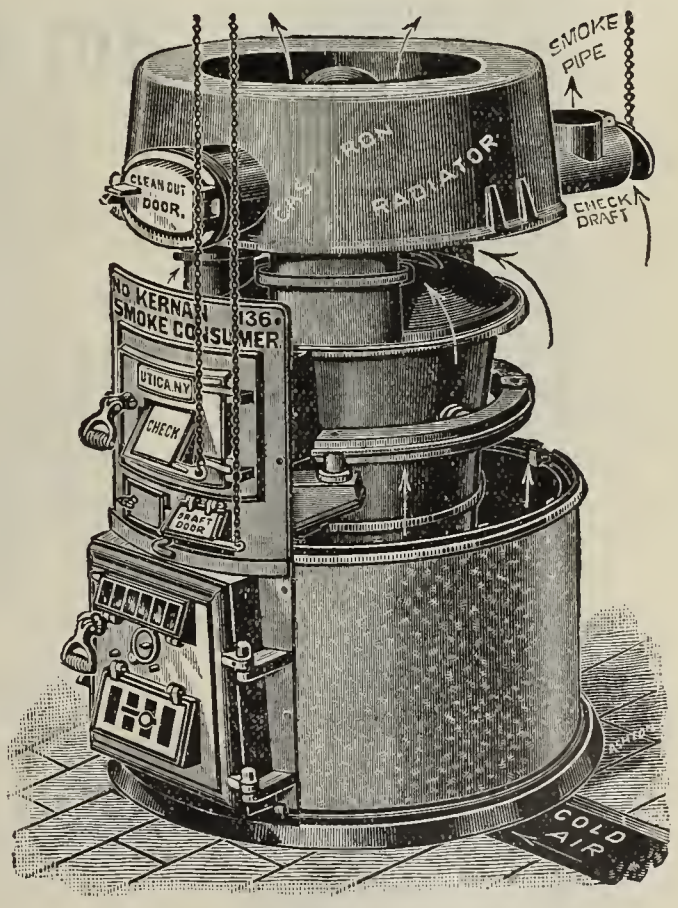
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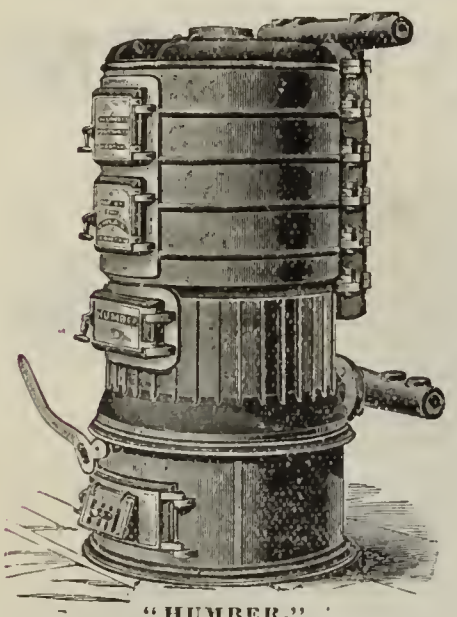
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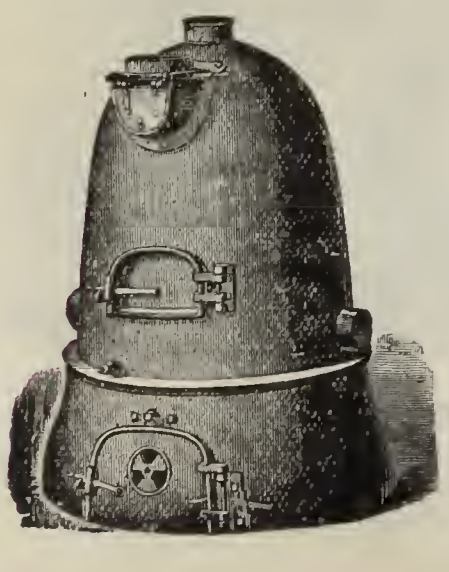
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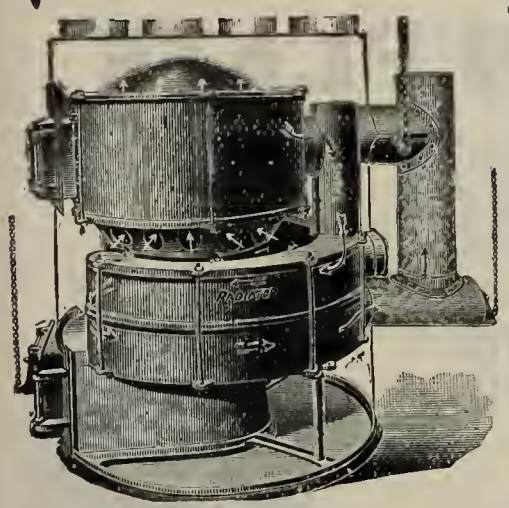


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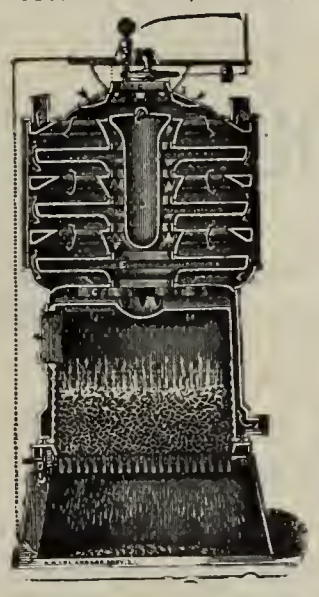
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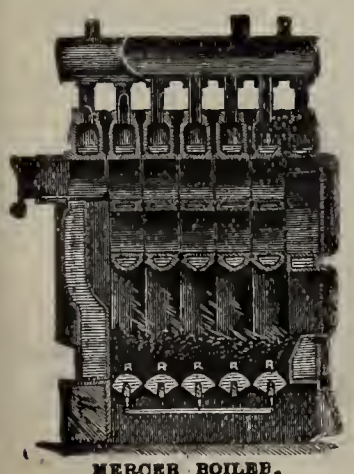
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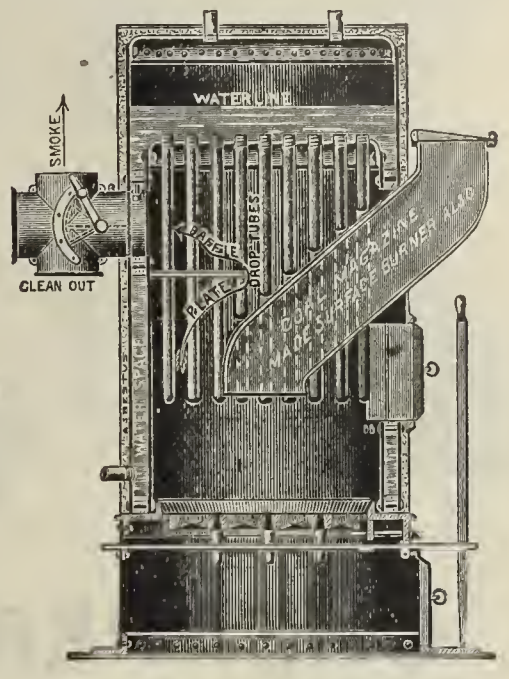
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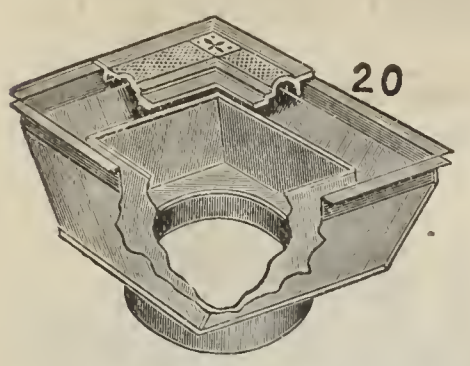
NOTE.—The Heatencook Range (House Heating from the kitchen fire) can be seen in operation at our Philadelphia store.

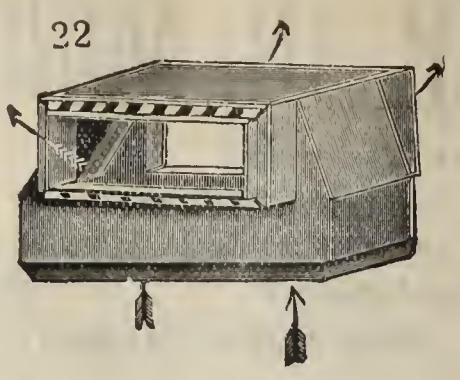


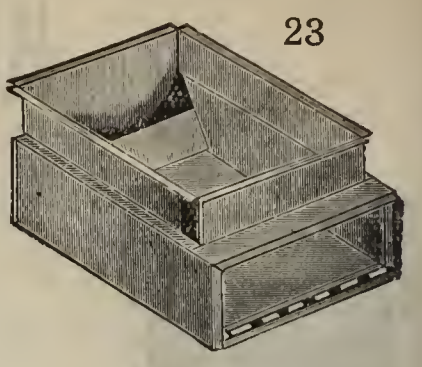


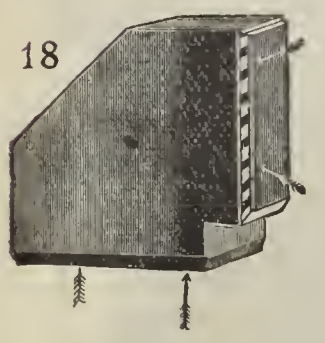
— WASTING HIS SWEETNESS —Cousin Rufus (of Boston): "These cloud-capped towers and noble palaces, majestic monuments—ay, the great earth itself—shall pass away, and, like the baseless fabric of vision, leave not a rack behind!"

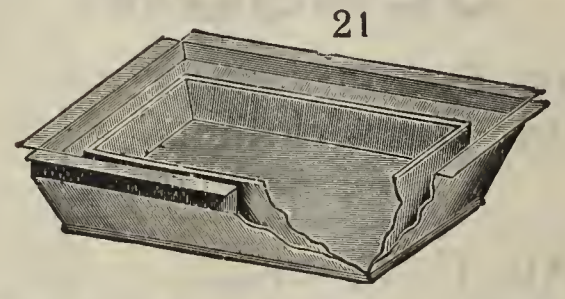
Cousin Kate (of Chicago): "Oh, Cousin Rufus, do you think there'll be time for us to get another ham sandwich?"—*Judge.*

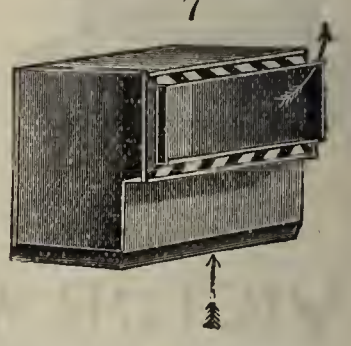

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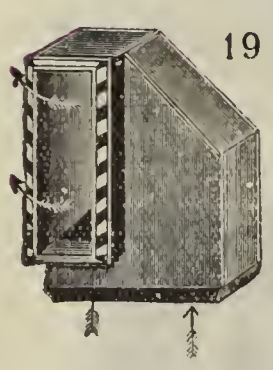

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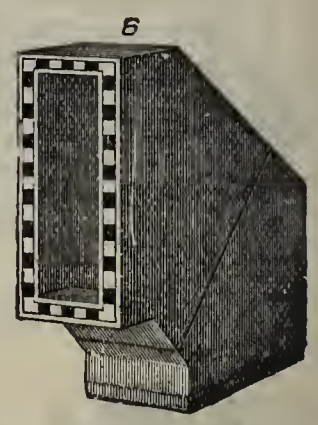

7

CHEAPER THAN TIN PLATE

WHEN MADE UP BY YOURSELF, ARE OUR

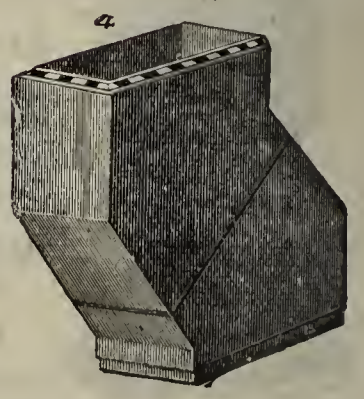
FURNACE PIPE AND FITTINGS.


19

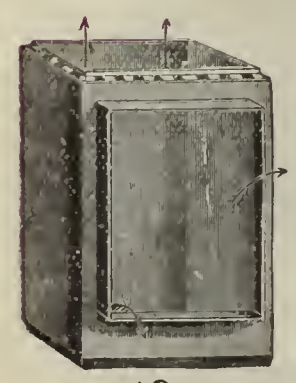

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Do any of these fill your requirements? If not send specifications.

YOU WILL SAVE MONEY.


4

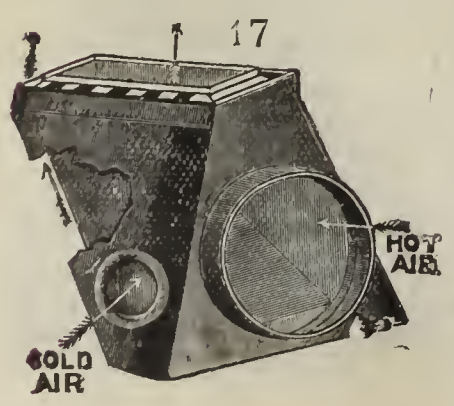
WE SHALL BE PLEASED TO SEND YOU CATALOGUE AND QUOTE YOU PRICES.

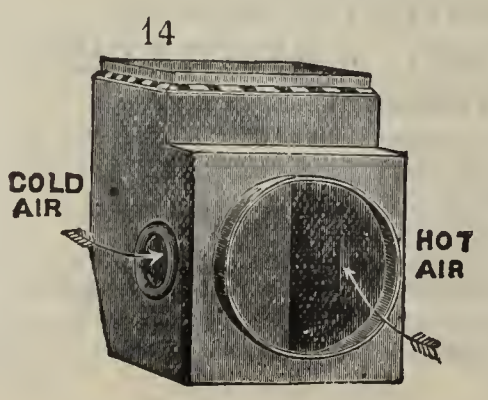

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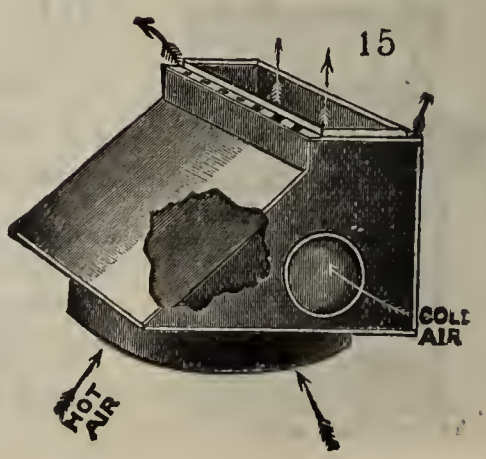
The Perfection Furnace Pipe Co.,

Cor. Broadway and Logan St,

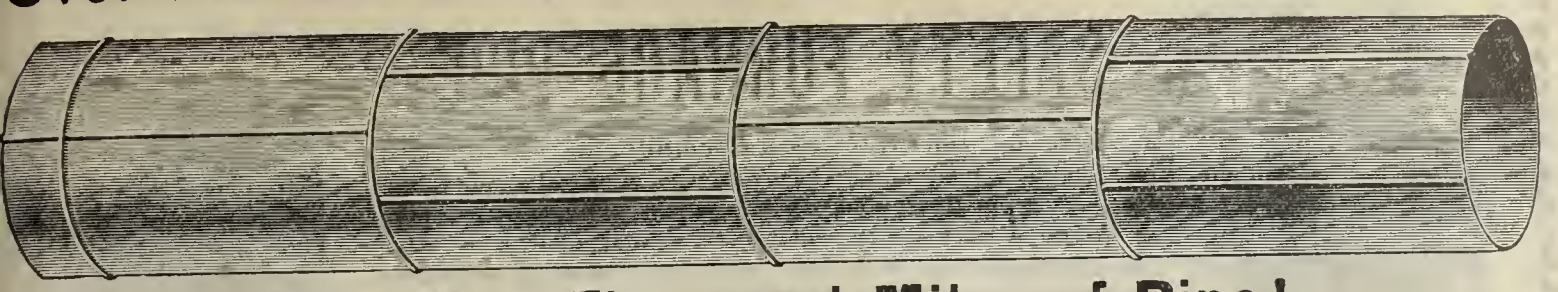
TOLEDO, O.



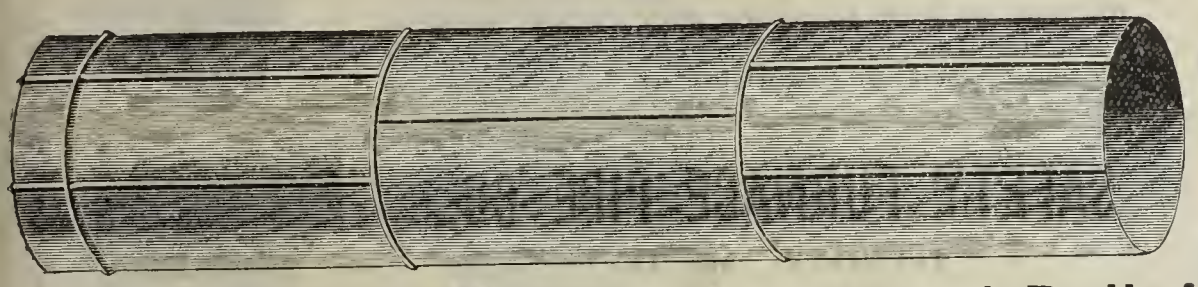




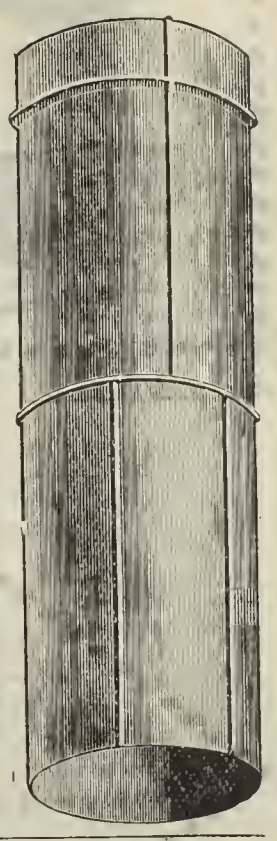
Over Five Million Feet of Hot Air Pipe Used Yearly!



Over One Thousand Miles of Pipe!

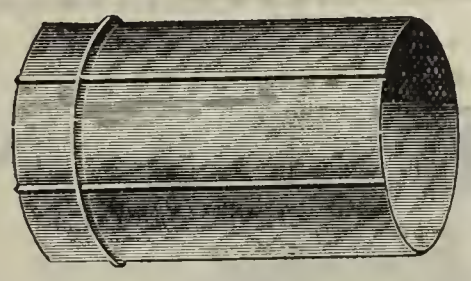


Over Three Miles of Pipe Used Daily!



We want to make *ALL* this pipe.

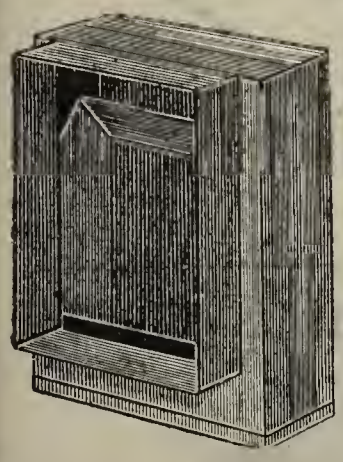
See price-list in last issue.



We have the capacity and are willing to make the price.

All lengths from 1 ft. 2 in. to 5 ft. 8 in.
All sizes from 7 in. to 30 in.

THE EXCELSIOR STEEL FURNACE CO.,
38 W. Monroe Street, Chicago.
FULL LIST ON APPLICATION.

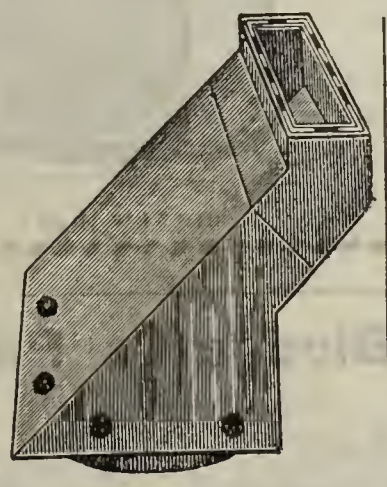


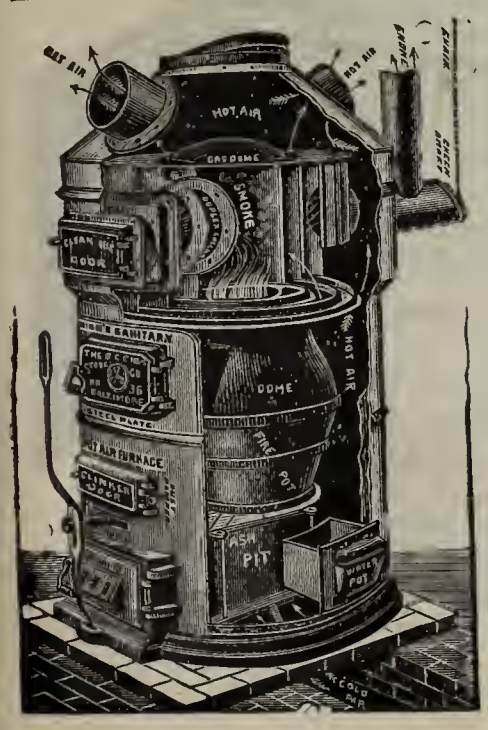
Novelty Ventilated Wall Pipe,

Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY
JOHN P. SCHAFFER.
18 Wood Street, Pittsburgh. Pa.





THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of
THE BIBB SANITARY
HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL
Baltimore Fire Place Heaters,

And a Full Line of
COOK STOVES, RANGES, HEATING STOVES, HOLLOW-WARE, &c.
Send for Catalogue with Testimonials.



THE
"Front Rank Furnace"
NEEDS NO INVESTIGATION.
IT IS THE BEST.
Front Rank Steel Furnace Co.
St. Louis, Mo.

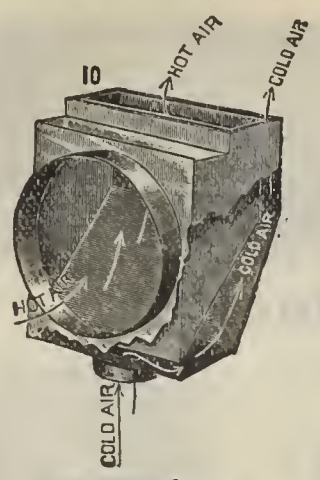
— THEY QUARRELED.—"Dey has done bruk de engagement."

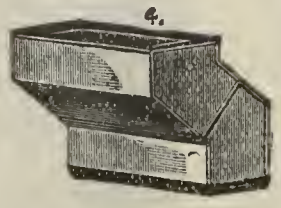
"Yoh doan say so."

"Yas indeed."

"What foh?"

"She done tas'ed a persimmon dat warn't ripe, an' he misconstrued de pucker an' kissed her."—*Washington Star.*





SAFETY FURNACE PIPE

Will save you ***money, time and trouble***. It is constructed on scientific principles, and has won the approval of practical furnace men in all sections of the country. Any ***length, size*** or ***shape*** of stack can be constructed without cutting or wasting a single inch of stock. Our goods are ***reliable, economical, convenient*** and ***profitable.***

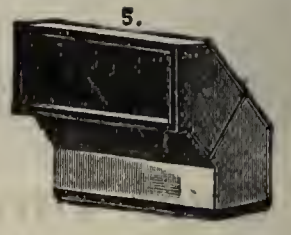
We want your trade.

We have the goods to supply your fullest requirements.

We want to send you catalogue and price-list.

We guarantee our goods to be first-class in every particular.



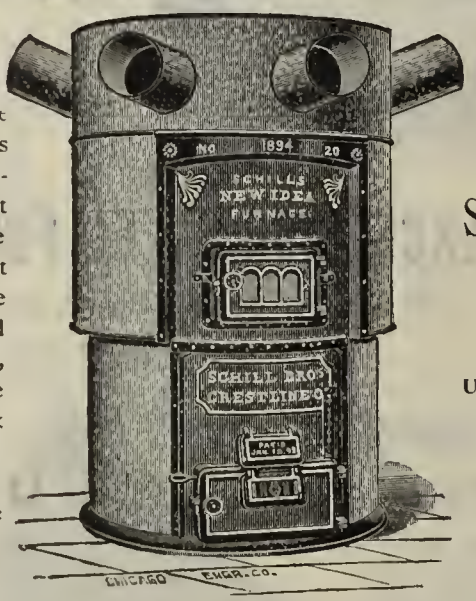


SAFETY FURNACE PIPE CO.,

DTROIT, MICH.

Eastern Agents, RITER BROS. & CO., Philadelphia, Pa.

We might write volumes upon the wonderful success and merits of our furnace, and although what we would or might write would be perfectly true, yet it would seem egotistical; therefore we prefer that those who have used them should proclaim their merits, and for that purpose have issued a small 36-page book clearly stating the facts relative to results, to be had free from



THE NEW IDEA.

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UNION IRON WORKS MFG. CO., DENVER, COL.

THE HELPER GAS RANGES BEST ON EARTH MANY STYLES & SIZES

We manufacture ranges for both natural and manufactured **Gas, Steel Ranges** for all kinds of fuel, Cast Ranges with **Patent Steel Oven** improvements, etc.

Correspondence Solicited.

CHICAGO & ERIE STOVE CO.

CHICAGO, ILL., and ERIE, PA.

Blodgett's Patent Portable Oven.

UNEXCELLED FOR

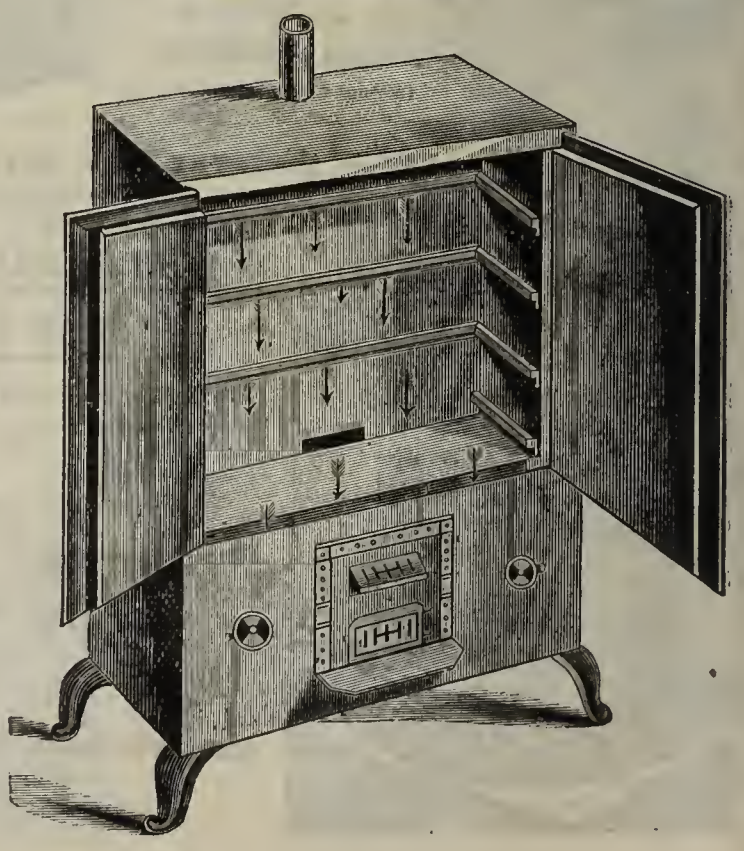
Hotels,
Steamships,
Confectioners,
Japanning,
Core Baking.
Public Institutions,
&c.

The Only Oven

BAKING BY

Perfect Circulation of Hot Air.

Made in ten sizes. Send for Catalogue.



THE G. S. BLODGETT CO., MFRS.,

Burlington, Vermont.

LIGHT ON THE SUBJECT

—OF—

STREET LAMPS.

We have it at last—"The Rochester" as a street lamp! The first and only Tubular Globe Central Draft Lamp ever made! Storms, rain, snow, sleet or hail do not affect it. Burns all night. Made with either bail or post socket, with 26 inch enamel reflector if wanted, for railroad and other uses. Dealers should order a sample at once of this new lamp. Price $6. Send for discount to the trade.



Three times the light of the old flat-wick street lamp, and as far in advance of it as the kerosene light is ahead of the tallow dip. Protected by metal gauze against bugs or insects. The globe is held up by hook while trimming or lighting. No broken chimneys, no flickering light. Takes regular No. 3 or 9 street lamp globe, to be had everywhere. For Railroad Stations, Warerooms, Mills, Docks, etc., it is the best lamp ever made.

MANUFACTURED ONLY BY

THE ROCHESTER LAMP CO.,

42 Park Place,—NEW YORK—37 Barclay St

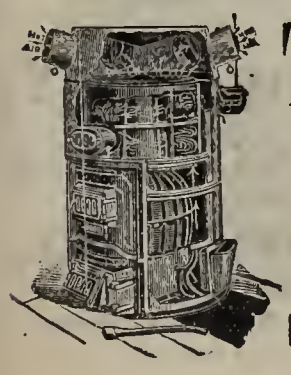


Beware of Infringing Stoves.

Parties dealing in oil stoves would do well to compare the hinge on this stove that the body swings on with others that may be offered them, as we are the patentees of said hinge, and shall protect ourselves against all parties infringing.

TROY OIL STOVE CO.,

TROY, N. Y.



The Boomer is a Success.

Guess which is one of the Leading Furnaces offered for sale to-day.

Write for Catalogue, which explains all about the Boomer.

HESS, SNYDER & CO., MANUFACTURERS. Massillon, Ohio.



The Expense Bill.

Once upon a time a certain house sent out its traveling men at the beginning of the season with many injunctions to keep sales up and expenses down; to sell wherever they could, but that no expense for treating would be allowed. By and by the travelers came in and turned in their orders to the manager, who looked them over and complimented the travelers more than he ever had before. The morsel of honey only covered the pill in his next request: Would they show him their expense accounts?

The first man handed his up and it was critically scanned.

"You have got down here 50 cents for dinner at Smalltown."

"Yes, sir."

"They only charge you 25 cents for dinner there!"

"Yes, but it's worth a quarter extra to eat such a meal."—*Maritime Grocer.*

—He Wanted a Mule.—A placid man, with an innocent guilelessness that was as beautiful to look at as it seemed easy to have fun with, stepped timidly into a livery and sale stable the other morning and asked for the proprietor. That gentleman came forward promptly.

"Anything I can do for you to-day, sir?" he asked with the courtesy of a courtier.

"Um-er," hesitated the visitor, "I want to buy a mule."

"I'm sure we can suit you; just got in a lot last week. Step this way, please," and the proprietor ambled out toward the rear of the stable.

"What kind of a mule do you want?" he asked, when they had reached the mule counter.

"I rather like the looks of that large and portly one over there by the wall," ventured the visitor in a hesitating manner.

"Here, John," called the proprietor to a stable boy, "bring out that large and portly mule," and he chuckled low down, as the boy led out the beast.

"There," he went on, "that is a mule fit to work anywhere; good eyes, good legs, broad shoulders, mealy nose, paint brush tail, all the modern improvements and you can have him for $175 cash; just what he cost to get him here."

The mild-faced man walked around him carefully, not to say cautiously.

"Fine animal," he murmured, as if afraid to speak.

"Fine as silk," corroborated the dealer.

"Will he kick?" asked the visitor softly.

The dealer's face showed a long streak of pain, his bosom heaved, and he threw up his hands in deprecation.

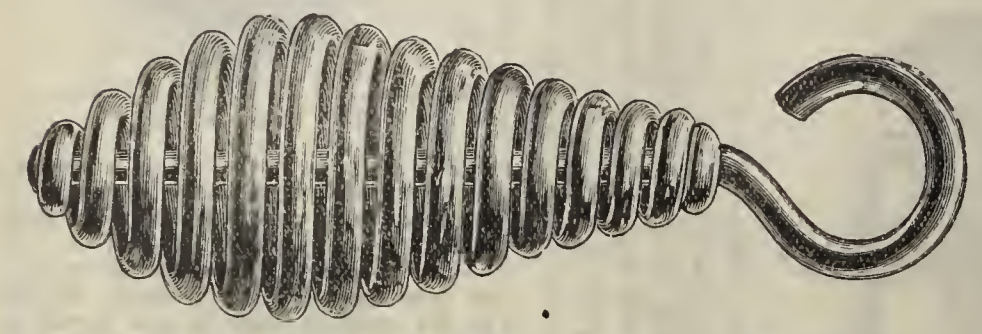
"My dear friend," he almost wept, "what do you take me for? Of course he won't kick."

The placid man turned away disappointedly.

"I don't want a freak," he said sadly. "I'm not running a dime museum," and disappeared.—*Exchange.*

ALASKA

MADE UNDER THE CAITLEY PATENTS.



STOVE KNOBS AND

HANDIES, TOWEL RODS,

KETTLE BAILS.

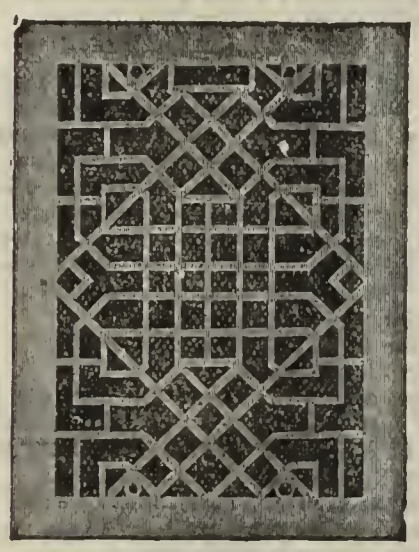
ALWAYS COLD.

POKERS, LID LIFTERS, SHOVELS, FIRE SETS.

Are good sellers. Send for prices to Hardware Jobber.

MADE ONLY BY

Troy Nickel Works Troy. N. Y.



Warm-Air Registers, Ventilators, Etc., Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, Buffalo, N.

WM. HIGHTON & SONS,

MANUFACTURERS

Registers. Ventilators.



HUB PATTERN.

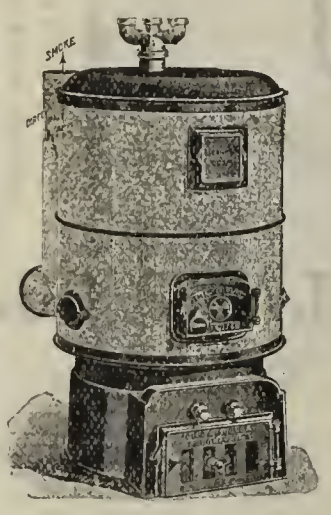
BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H

— PRISONER: "I beg you, judge, not to condemn me—not on my account, but so as not to injure the prospects of my counsel."—*Fliegende Blätter.*

THE

Scollay Hot Water Heater

For Warming Dwellings, Stores, Offices, Churches, Public Buildings, &c.



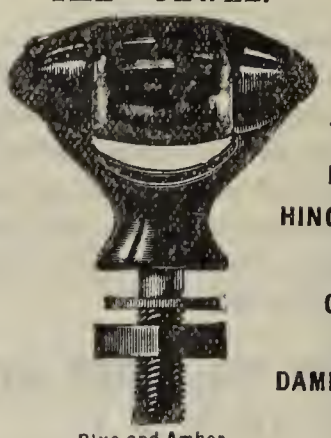
Also Boilers specially constructed for Greenhouses, Conservatories, Baths, Laundries, &c.

SEND FOR ILLUSTRATED CATALOGUE AND PRICE-LIST.

JOHN A. SCOLLAY,

72, 74 & 76 Myrtle Ave., BROOKLYN, N. Y.

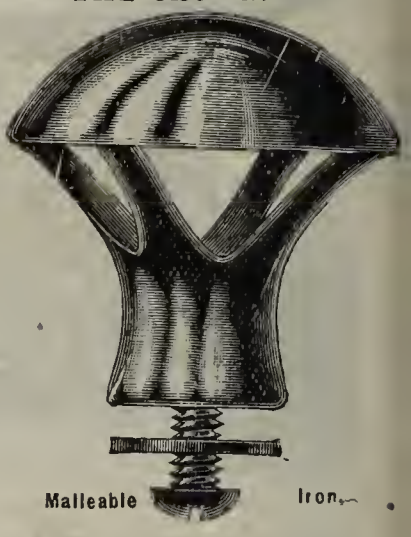
THE "JEWEL."



Blue and Amber.

Manufacturer of
MALLEABLE IRON
TURN-KEYS, SHAKERS,
DAMPER SLIDE KNOBS,
HINGE PINS, POKERS,
LIFTERS,
CROWN DAMPER,
—AND—
DAMPER ATTACHMENTS.

"THE CROWN."



Malleable Iron.

W. F. GREENE, Troy, N. Y.

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ALL KINDS AND SIZES.

WRITE FOR PRICES TO

PALERMO MICA CO.,

MINERS, IMPORTERS AND WHOLESALE DEALERS,

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S. T. PECKHAM, Sales Manager.

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Perforated Filter Press Plates.

THE HARRINGTON & KING PERFORATING CO. CHICAGO.



BRONZE SCREEN PLATES To withstand action of ACIDULATED WATERS.

METALS OF ALL KINDS PUNCHED TO ANY SIZE AND THICKNESS REQUIRED

For Coal, Coke, and Ore Separators, Fixed and Movable Screens, Jigs, Trommels, Washers, and Sizers of all kinds.

For Grain Cleaning Machinery, Gas and Water Works, Oil, Flour and Rice Mills, Sugar Houses, Distilleries and Fertilizing Works.

Heavy Steel and Iron Plates and Cylinders for Coal and Coke, Breakers, Ore, Stone, Phosphates & Gravel Screens

Perforated Tin and Brass of all sizes for Oil, Gas and Vapor Stoves, Lamps, Lanterns, Ventilators, Filters, &c.

THE HARRINGTON & KING PERF. CO, Main Office and Works, 224 to 240 N. Union St., Chicago, Ill., U.S.A.
Eastern Office, No. 284 Pearl St., New York.





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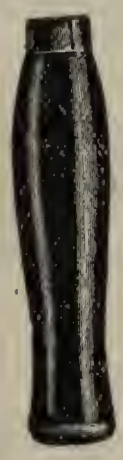
MICA

NORTH CAROLINA
WYOMING,
AMBER.

EUGENE MUNSELL & CO.,
218 Water Street, NEW YORK.

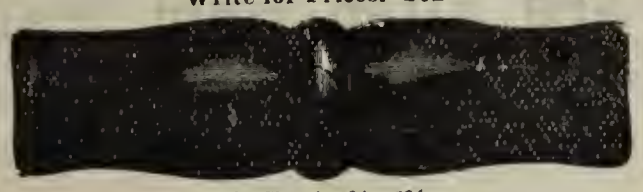
NEW HAMPSHIRE
MICA
IS THE BEST.

The F. E. BELDEN MICA MINING CO.,
12 Broad St., Boston, Mass.



THE SPECIALTY WOOD WORKING CO

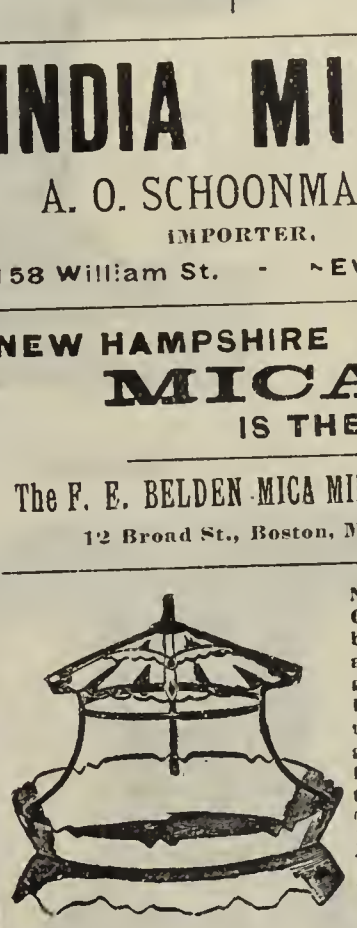
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When the honest subscriber presents it to view;
But the man who don't pay—we refrain from description—
For, perhaps, gentle reader, that man may be you.

—HOWL WASBORNE (at the church wedding): "Oh, ah—are you an usher? Won't you please give me a front seat?"
Usher: "Are you one of the family?"
Howl Wasborne: "No, but I tried to be."—*Puck.*



No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8¼ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

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There are no old relics or fossils in the B. & B. line.

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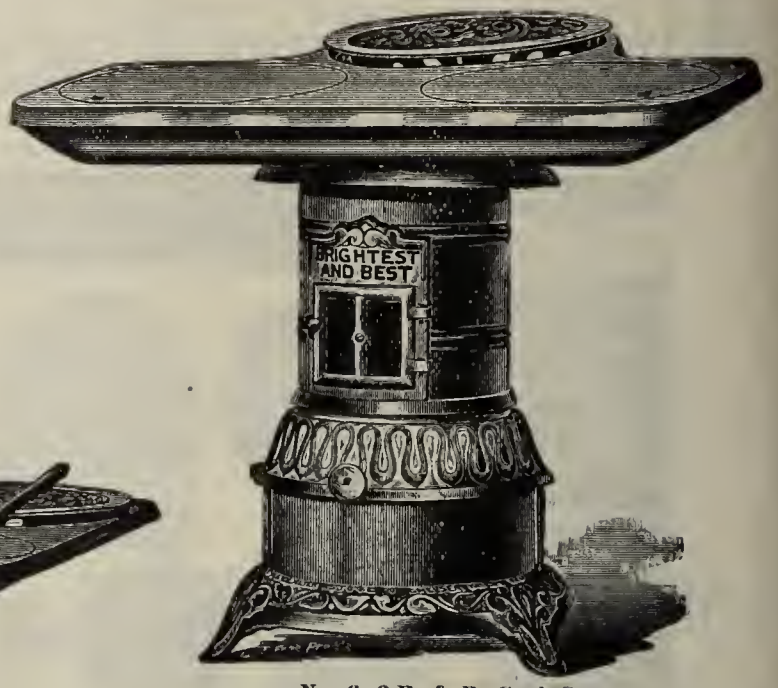
No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozen in box. Weight, 85 pounds. Height, 8½ inches. Size of Tank, 5½x5¾. NICKEL FRONT. Two 4-inch wicks.



No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozen. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8½ inches. Size of Tank, 5½ x 8½ inches. NICKEL FRONT. Three 4-inch wicks.



No. 6—3 B. & B. Cook Stove.

Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.



No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.



No. 8, B. & B. Cook Stove.

Nickel Finish. List Price, $9.00. 7½ inch double thick circular wick.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**

It will pay you to consider these points.

We Are After Your Trade.

You will always find the B. & B. Stoves up to date in every particular.

You cannot spend a little time more profitably than in looking over our 80-page catalogue. Ask for one, with discounts.

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THE METAL WORKER.

NEW YORK AND CHICAGO.

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Cheap Heating.

We are now at the season when winter heating apparatus of all kinds goes out of service. A good deal of it, in the natural order of trade, should have gone finally out of service last year; but in view of the panicky feeling which prevailed and consequent attempts to secure unusual economies, it has been made to hold over by various shifts and devices against the desire for newer and better apparatus. Those who find themselves at the end of the heating season with worn out boilers or furnaces will do well to consider at once whether there will ever come a more favorable time for replacing it. All sorts of goods seem to have settled down upon the very bed rock price; and contracting firms with comparatively idle facilities are not only looking around very sharply for more work but are willing to execute contracts at prices quite unprecedented in the trade. It is believed by many that heating contract work will be done in this summer of 1894 more cheapily than it will be possible to get such work done for many years to come. Besides, a worn out heating plant is not economical of money, comfort or health; and when such plants have reached a certain stage of decreptitude they ought to be summarily replaced by new installments.

Good Time for Renewals.

Especially should apparatus for heating schools, churches or assembly rooms be carefully scrutinized now for the discovery and removal of any defects. Such installments usually cost more than domestic heating arrangements; and if it be now necessary or desirable to make expensive repairs or to renew boilers or furnaces the present state of the market is well worth considering by school boards and committees. School heating and ventilation apparatus when out of order exert a deleterious influe ce upon health, especially in overcrowded school rooms. It is almost a crime to neglect the restoration or supply of anything needful for the effective warming and ventilating of school buildings, yet many boards and committees are apparently heedless of the state of school buildings under their charge. This indifference, we are glad to say, has been replaced by active interest in many localities during the past few years. But there still remain men who seem to regard a school as a kind of charity institution to be maintained at the lowest possible cost, regardless of sanitary requirements. But if lowest possible cost be now anywhere the controlling motive, and the time has arrived for renewals or repairs, there will not soon be another season in which work of the kind required for schools can be secured at as low a price as it can probably be secured during the coming summer.

Railroad Progress.

The twenty-fifth anniversary of the completion of the first all rail line across the American continent, which occurred last week, brings to mind the phenomenal progress in railroad building and railroad traveling that has been made in this country during the past quarter of a century. In 1869 there were 47,254 miles of railroad in existence in the United States, while on January 1, 1894, there were in operation 175,223 miles of track, or nearly four times as much. The enormous advance which has developed in the interval in speed and safety, and in the conveniences and facilities of travel, as well as in the rolling stock and general equipments of the roads, is still more remarkable. The number of the traveling public, too, has increased in a still greater ratio than the railroad mileage since the golden spike was driven on May 10, 1869, marking the completion of the first great American transcontinental line. Since that day four more roads have stretched themselves across the continent from ocean to ocean, while others are now in contemplation. What another 25 years may bring forth in the field of railroad progress can only be imagined.

The Cost of Necessaries.

In these times, when the majority of people in the United States are suffering from reduced incomes or shrunken business profits, and when the earnings of workers have decreased, or are temporarily suspended by reason of lack of employment, it is some compensation to know that never before did it cost so little to live. Food and clothing—the necessaries of life—in particular, have never been so cheap as they are at the present time. So that, while luxuries and superfluities may in many homes have been ruthlessly cut down during the past year of depression, there has been happily little reason for painful retrenchment in the absolute necessaries of existence. The following table, compiled by the *American Grocer*, showing the quantity of different food products which $100 would buy at wholesale rates at different periods for the past 32 years, clearly illustrates the downward tendency of prices for these necessaries:

	1862-67.	1872-77.	1882-87.	1894.
Tea, Japan, ℔...	187	244	454	500
Sugar, ℔.....	606	894	1,333	1,848
Mess beef, bbls..	7	8 2-5	8 2-5	13
Mess pork, bbls.	4.2	5.5	6 6	8.7
Lard, ℔.....	666	909	1,143	1,579
Coffee, ℔	367	518	993	551
Flour, bbls.....	13.7	16.1	15.1	19
Corn, bush.....	120	141	166	175
Bacon, ℔.....	752	990	1,042	316
Butter, ℔.....	294	300	370	351
Molasses, gals...	188	285	392	800
Rice, ℔.	800	1,111	1,540	1,750
Starch, ℔.....1 052		1,063	2,273	2,666
Soap, ℔.....	1,000	1,470	2,000	2,500
Potatoes, bush..	98	120	125	154
Salmon, canned, dozen	25	63	85	77
Tomatoes, can'd, dozen..	40	48	93	108
Corn, canned, dozen.....	33	45½	100	111

Coffee is the only generally used article that shows any material advance. Clothing of the ready made kind may now be purchased at prices which for cheapness compare favorably with those of Europe, and which a few years ago would have been thought chimerical.

The State Department has just issued a series of recommendations from various United States Consular Agents in South Africa regarding the packing of goods for export to that country. Among other advice, the opinion is generally expressed that all goods liable to damage by weather should be packed in cases lined with tin and not merely with water proof paper, the latter not being sufficiently proof against the heavy rains of South Africa. The complaint is also made by importers that oil cases sent from the United States are too flimsy and should be made of heavier tin, in order to stand the rough treatment incidental to the carriage of these goods overland by ox wagons and other primitive methods of transportation.

A high tower is to be constructed at Fredericksburg, a suburb of Copenhagen, by Colonel Somefeldt. It will be 600 feet high. The Danish Minister of War has reserved the right to use the top as a military observatory.

What will be the largest dry dock in the world is now building at Southampton, England. It is to be 800 feet long, 110 feet wide, and will have 27 feet of water over the sill.

THE LETTER BOX.

What Causes Siphonage?

From P. LUMBER, *Connecticut*.—In answer to "Inquirer" in *The Metal Worker* of April 28 as to the cause of siphonage of the fixtures shown and described, I would give the following explanation:

When the closet is flushed it has to draw its supply of air from the vertical 2-inch pipe. It draws with equal force on the contracted 1½-inch horizontal line, or possibly with greater force. When the flushing water reaches the 4 x 2 Y it acts as a piston of a pump and draws the air from the horizontal 2-inch waste pipe, making the second and combined cause of siphonage of the traps of both the bowl and the bath. I would overcome this difficulty by making a separate 2-inch connection from the water closet direct with the vertical air pipe.

Defective Draft.

From J. F., *Willimantic, Conn.*—In *The Metal Worker* of May 5, "W. S." inquires what caused the trouble with a chimney that is 4 x 12 inches, inside measurement. One trouble is that the flue is too narrow. Flues should never be less than 8 inches wide. Twenty-five years as a mason have taught me something about building chimneys. A flue should never be less than 8 inches square, or better 8 x 12, and should be plastered smooth inside. If there are any extra openings for a stove they should be shut when the stoves are removed. I was called to examine a chimney recently, and found three fire places in the chimney. They were closed up with wooden fire boards and the owner thought they were all tight. but in one room there was a bureau against the fire place, and on removing it I found that the fire place had some time caught fire and had a large hole burned in it. It was a wonder that the house was not destroyed. After bricking up this opening the stove which had failed to prove satisfactory operated with excellent results. My customer paid the bill and said it was the best investment he had ever made of his money. Every mason knows that a chimney should be higher than the adjoining buildings or it will be affected by a wind blowing across or possibly down it.

Patterns for Portable Bathtub.

From A. G. K, *Lucknow, Ont.*—I would like to be informed how to obtain the patterns for a portable bathtub, flaring at each end, using trammels or compasses for obtaining the patterns.

Answer.—On page 98 of "The Metal Worker Pattern Book" is presented the method of obtaining the patterns of an oblong tapering article, one end square and one end semicircular, having more flare at the ends than at the sides. The pattern of large end of article is derived from the frustum of a scalene cone, and the method shown for obtaining the patterns will probably fulfill our correspondent's requirements.

Choked Water Backs.

From E. J. Y., *Regina, N. W. T.*—Will *The Metal Worker* inform me of some way to get over my difficulty with hot water connections on kitchen ranges in this locality? We have three ranges connected with upright boilers in the usual way, only in place of water backs we have 6 or 8 feet of 1-inch pipe in a coil over the fire. These pipes block up with a solid coating of a flint like substance in from two to six months, and then burst open. One customer has decided that the expense of renewing is too great, coming as it does every couple of months, and has had the coil taken out permanently. The other customers have their taken out regularly every two to six months. The pipes do good service when clean, heating the water quickly when used. The water used is taken from deep wells on the premises and has some alkali in it.

Answer.—It is needless to point out to our correspondent what he already knows, that the difficulty is the alkali in the water, and that the incrustation in the coils is similar to that which takes place in steam boilers and which is such a prolific source of trouble and expense. For power boilers there are many so-called boiler compounds, the purpose of which is to soften the incrustation by changing its nature, and then when it is in a removable condition the boiler is blown off, cleaning it out. Such applications, however, are entirely impossible in the present case, for the boiler compound would make the water unsuitable for domestic purposes. Our correspondent has to meet this difficulty—that is, the incrustation of a foreign substance on the heating surface—and it remains to be seen how this trouble can best be lessened, for it cannot be avoided. Our suggestion is to make the coils of very much larger pipe. One inch is needlessly small, and while this size gives good quick results through the extended heating surface when the pipes are new, there is but little space to block up with the deposit. Two-inch pipe is small enough for the purpose, and experiments might even be made with larger pipes. By the use of pipe of 2½ inches diameter, for instance, it is evident the choking process will extend over a much longer period of time. On the other hand, it must be remembered that the deposit is a very bad transferrer of heat, and the efficiency of the coil will continually decrease, so that after the pipe has, for instance, a ¾-inch coating on the inside it will transfer heat very sluggishly to the water. This, however, is the best suggestion we can make, for we presume without inquiring that it is impossible to secure a better water supply. Of course, if rain water could be stored and used for the purpose the difficulty would be solved at once. We would like to hear from those of our readers who have had experience with hard waters in kitchen boilers and water backs.

Square and Angle Miters.

From W. D, *Hoboken, N J.*—Please publish the pattern for angle miter of cornice. I understand square miter, but cannot make profile so as to describe angle miters.

Note.—Our correspondent's difficulty probably arises from the fact that he has learned to draw square miters by the short method—that is, without the use of the miter line. When the miter line is at 45° there is no need of dropping lines to it from the profile and then to the stretchout, for the result is the same as if dropped direct from the profile into the stretchout. When the miter line is other than 45° it is necessary to make use of a plan. Our correspondent will find this method fully and clearly explained on pages 68 and 69 of "The Metal Worker Pattern Book."

Water Pressure.

From W. H F., *Washington Depot, Conn.*—Please give me through the columns of *The Metal Worker* some rule for ascertaining the pressure in a water main, the fall and size of pipe being given.

Answer.—The rule for finding the pressure of water is to multiply the hight in feet by 0.43, the result being the pressure per pound in square inches. This is the rule that we would recommend to our correspondent, but at the same time we must point out that there are many minor factors omitted. If the water is flowing through a pipe and the pipe is of small diameter the friction will decrease this pressure. The condition of the inner surface of the pipe will also affect the pressure, a rough pipe making more friction. Sharp bends must also be taken into account. We assume, however, our correspondent merely wants a general rule, and the one above given will probably answer his purpose.

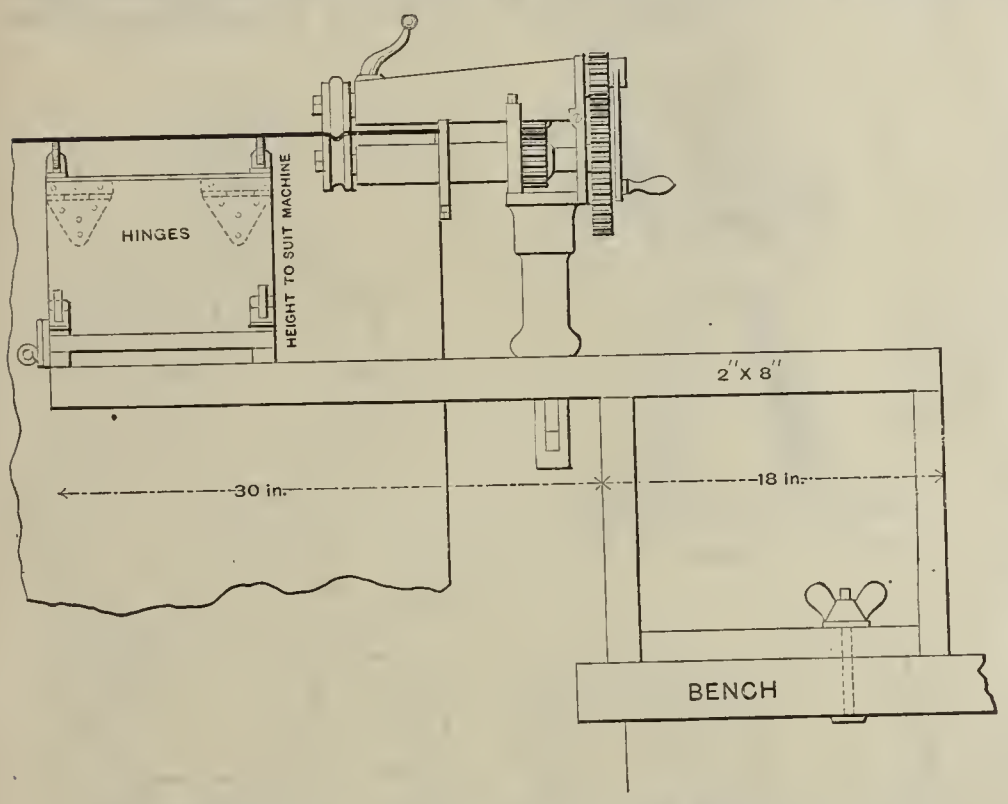
Fire Place Smokes.

From I. G. L., *New York City.*—In reply to the inquiry of "J. A. S.," in *The Metal Worker* of May 12, he can

overcome his trouble to a large extent by stopping off the chimney just below where the flue from the grate enters it.

Swedging Large Furnace Bodies.

From J. J. F., *New York.*—Some of the readers of *The Metal Worker* who swedge large furnace bodies may appreciate what a valuable assistant is found in a device of which I send you an illustration and description. Bodies of from 40 to 60 inches in diameter can be readily swedged by one man when it is used. Mine is arranged to bring the point between the rolls 52 inches above the floor. This is done by setting one end of an oak plank 2 inches thick, 8 inches wide and 4 feet long, on a base made of strong boards, as shown in Fig. 1. The base should be as wide as the plank and about 18 inches long, and should set on the work bench and be fastened to it at the back end by two bolts long enough to go through both and having wing nuts. A hole should be cut in the plank for the swedging machine stand. The hight of the base must be sufficient to make the 52 inches when added to the hight of the work bench and the machine, and if braces are put on each side of the base it will be stiffer. At the outer end of the plank place a piece of inch board 1 foot long and 4 inches wide, supported by two tapering uprights. On each end of the 4-inch strips put a universal caster. The hights of the supports should bring the top of the casters level with the point where the rolls meet and they should be on a line with the roll shaft. On each side of the top strip hinge a piece of board 12 inches wide and 15 inches long and put a universal caster on each of the outer end corners. To each of the hinged boards fasten a piece of iron $\frac{3}{16}$ x 1 inch and 15 inches long by means of a round head screw through a hole in the iron. To let one iron work smoothly on top of the other, a piece of the iron 1 inch square with a hole in it should be put under one of the irons where it is fastened to the hinged board. In the other end of the iron drill $\frac{1}{4}$ inch holes $\frac{3}{4}$ inch apart for half its length. Put a $\frac{1}{4}$ inch hole in the front upright near the bottom and have a $\frac{1}{4}$-inch pin 4 inches long with an eye at one end so that it can be fastened by a cord to the upright. By placing the pin in the holes in the iron and upright, the hinged board can be supported at any hight to make the casters carry heater bodies of different diameters.



Swedging Large Furnace Bodies.—Fig. 1.—*Showing Side View of Apparatus.*

Pearl Gas Stoves.

From R. & B.—Will some one please tell us the address of the makers or New York agents of the Pearl gas stoves?

D. R. Brownlow, Middletown, Conn., has brought out the Perfect curling iron heater and lamp stove. This little device consists of a steel spring support for fastening to the top of a lamp chimney and above it is a heater into which the curling iron is placed. It is arranged so that there is an outlet for the hot gases and surplus heat, thus not interfering with the lamp flame. By opening the cover the stove can also be used for heating and cooking purposes.

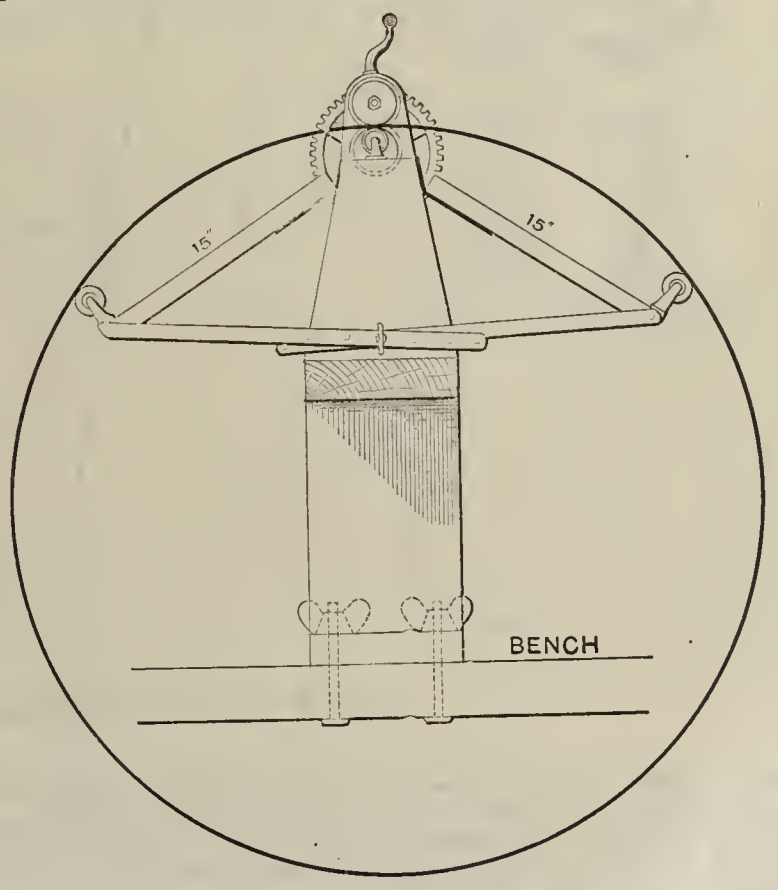


Fig. 2.—*Showing End View.*

Metal Work in India.

The following extract from the "Directory of Indian Manufactures" for 1894, published by the *Indian Textile Journal*, contains some interesting information in regard to the brass and copper works of India: "On account of national and religious customs, brass and copper vessels for cooking, eating, or drinking are to be found in every house, and the workers in those metals are more numerous than those in iron. The hollow ware is nearly all made of imported sheets, which are hammered and brazed into shape. The vessels used for cooking are tinned inside. Brass foundirg is generally done on a small scale, and a good deal of door, window and other furniture is thus made. The capital towns possess a few larger foundries, which turn out rough hinges and other articles very cheaply. Brass hinges are much used in India on account of the destructive effect of the monsoon rains upon iron hinges, which are never oiled. These foundries have none of the system by which labor is expedited and cheapened as in Europe; gauges and templets are unknown and accuracy ignored. A glance at the import lists of brass work alone would show that a well organized brass finisher's shop would pay a better profit on its capital than any engineer's workshop. There is also a considerable business in hollow ware of hammered sheet iron most skillfully riveted and brazed together. It is much more durable than the imported galvanized iron bucket. The whole of this work is done by hand labor, without the assistance of any stamp or press. Machines were once tried in a Bombay workshop, but as the inferior sheet used would not bear the process, it was abandoned. The experimenter did not know that better sheets were needed for stamping than for working with the hammer. Machinery has thus been condemned as a failure for this particular purpose in Bombay."

Press Working of Sheet Metals.—VI.

BY OBERLIN SMITH.

Curling Process.

Somewhat analogous to forming processes, but involving a new principle not yet herein touched upon, is the operation of "curling" or "wiring," with its various modifications. The two words just quoted as names for this process are used synonymously, although it would be correct to confine the term "curling" to the operation of putting a curled edge upon the top of a pan, cup or other vessel without any wire inside of it, this being often spoken of as imitation wiring. The man who first called it simply "wiring" must have had in mind the boy who took to market an "empty bag with potatoes in it." Real wiring is the same process when done around a ring of wire, which, of course, stiffens the vessel very much more than does the bastard process before mentioned. The latter, however, is cheaper and easier to perform, and often answers a sufficiently good purpose. In Fig. 185 is shown, in vertical axial section, a pair of outside wiring dies for cylindrical work, such as tin cups, dinner pails, &c. This process, it should be mentioned, is usually confined to thin metals like tin plate, sheet iron and sometimes brass and copper, all of which are usually less than $\frac{1}{32}$ inch thick. In such tools the lower die L serves mostly as a receptacle for the work, while the upper die U does the actual curling. Were the dies in question for curling only the loose ring *a* (which is driven to the upward position shown by suitable springs and limited therein by proper stops) might be omitted, the top of the die being solid, as in Fig. 189. As it is, this ring is used to support a wire ring, Fig. 186, which is laid loosely around the top of the uncurled work, Fig. 187, and which creeps down as ring *a* descends by the action of U. At *b* is shown an adjustable bottom upon which the work rests and which is regulated by the screw *c* or its equivalent. This construction enables the same die to be used for various hights of work. In cases where but one hight is required this bottom is made in a solid piece with the rest of the die, as in Fig. 189. In Fig. 188 is shown the finished work as curled without containing the wire ring, such dies being available for making it either with or without the same.

In Fig. 189 is shown a pair of curling dies for outside curling upon the large end of conical or tapered work, such as is shown uncurled in Fig. 190 and curled in Fig. 191. It is suitable for dish pans, milk pans, sauce pans, buckets and such like work. Should it be desired to put in a real wire, the top of

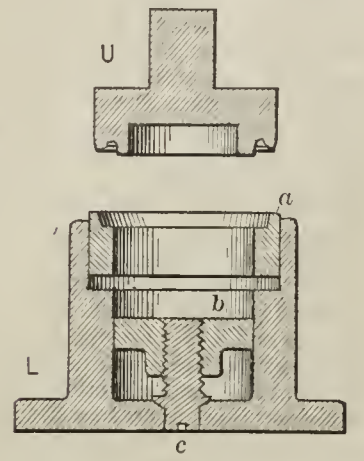


Fig. 185.


Fig. 186.


Fig. 187.


Fig. 188.

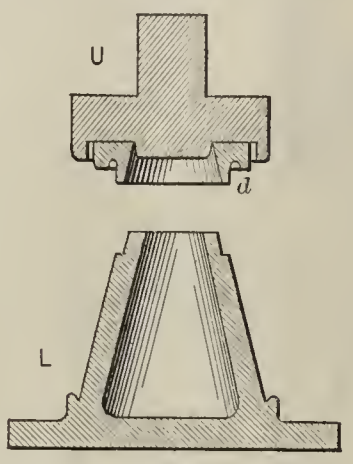
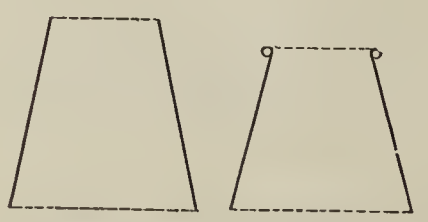


Fig. 192.


Fig. 193. Fig. 194

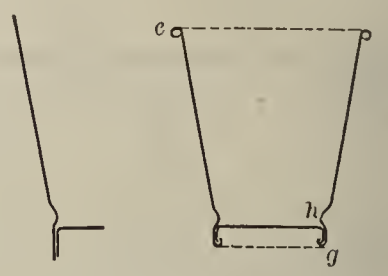
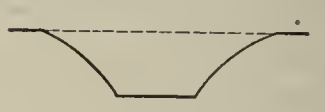


Fig. 199. Fig. 200.


Fig. 201.

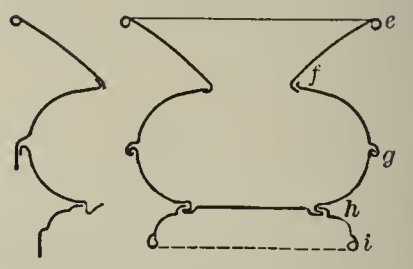


Fig 202. Fig. 203.

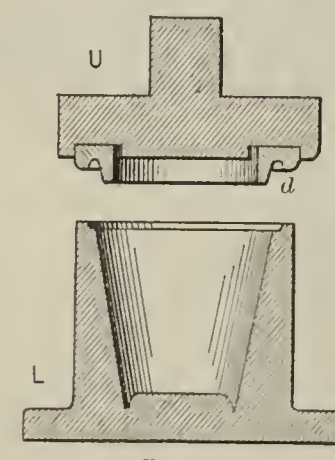
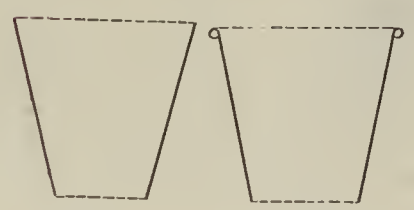


Fig. 189.


Fig. 190. Fig. 191.

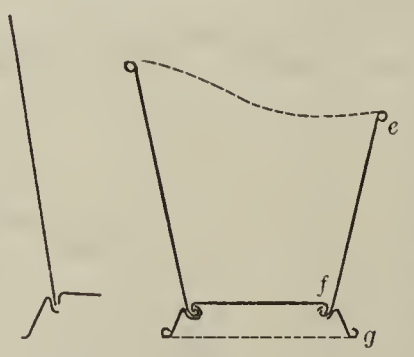


Fig. 195. Fig. 196.

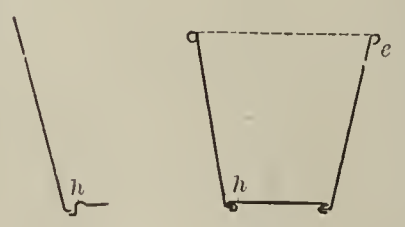


Fig. 197. Fig 198.

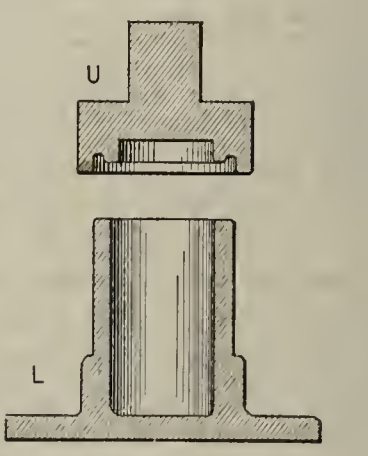
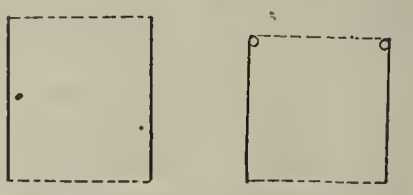


Fig. 204.


Fig. 205. Fig. 206.

die L is supplied with a floating ring, as at *a*, Fig. 185. In tapered work like this it is evident that the curling, as it successively passes through the different stages shown in Figs. 218 to 221 inclusive, must grow smaller in its general diameter, as it creeps down the cone to smaller and smaller diameters of the tapered work. It is therefore necessary that the curling ring *d* should be detached from the remainder of the upper die, that it may gradually decrease its diameter as it goes downward in doing its work. That it may thus become a contracting ring, it is made in a number of sections, usually being sawed apart radially into perhaps six or eight pieces. These are, of course, properly supported in the main body of U, and are supplied with springs to drive them outward as they ascend, so that they will be ready for the next piece of work. It is found in practice that such rings are sufficiently

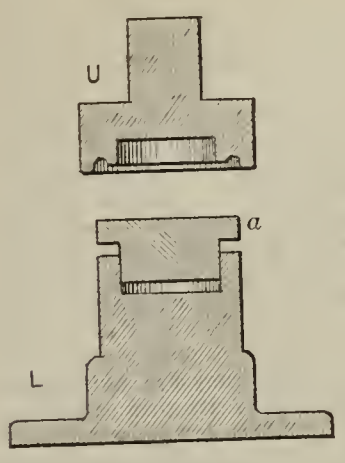


Fig. 207.

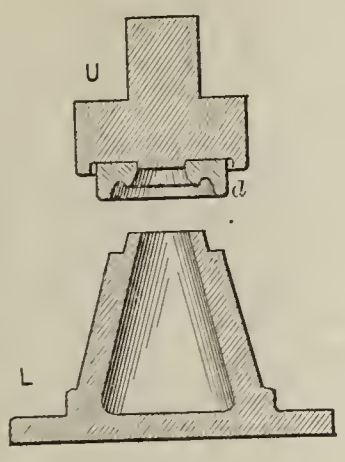


Fig. 213.

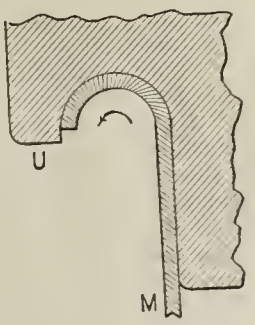


Fig. 219.



Fig 224.

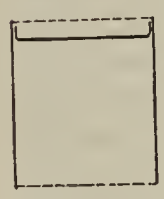


Fig. 208.



Fig. 209.

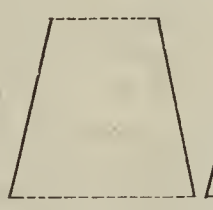


Fig. 214.

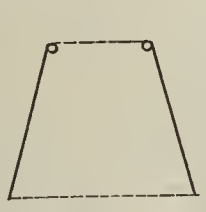


Fig. 215.

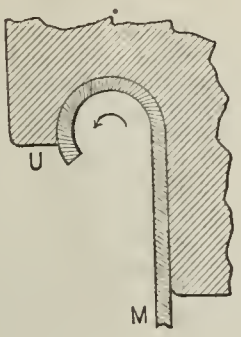


Fig. 220.

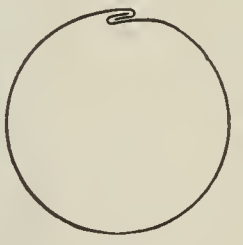


Fig. 225.

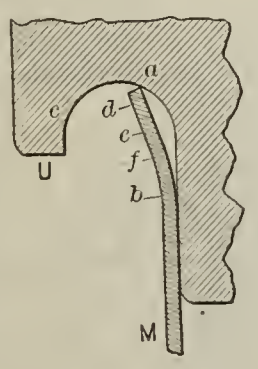


Fig. 216.

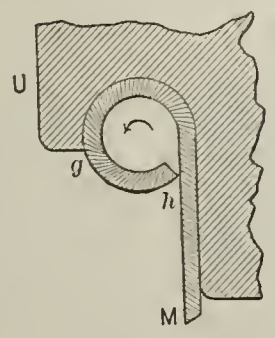


Fig. 221.

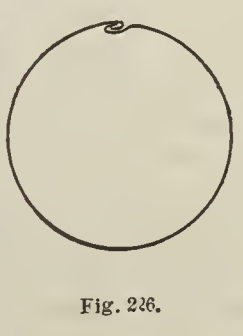


Fig. 226.

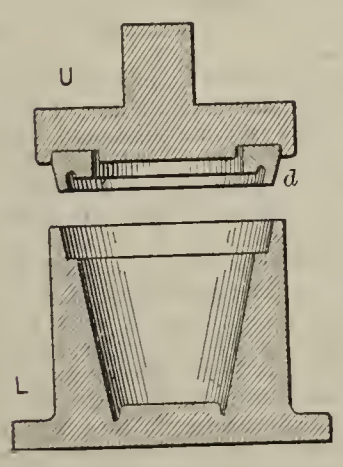


Fig. 210.

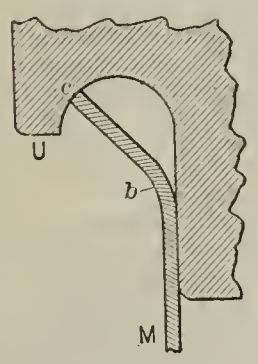


Fig. 217.



Fig. 222.

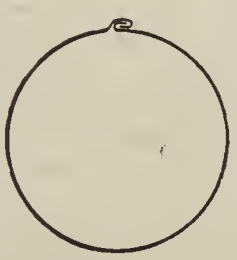


Fig. 227.

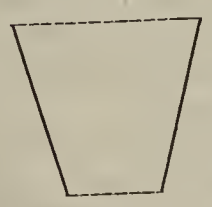


Fig. 211.

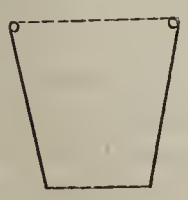


Fig. 212.

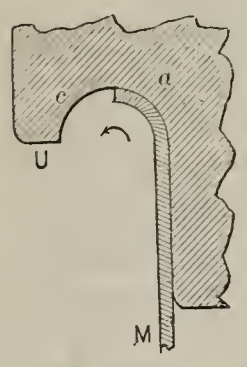


Fig. 218.

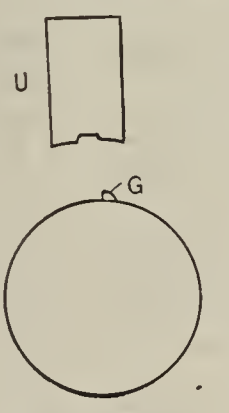


Fig. 223.

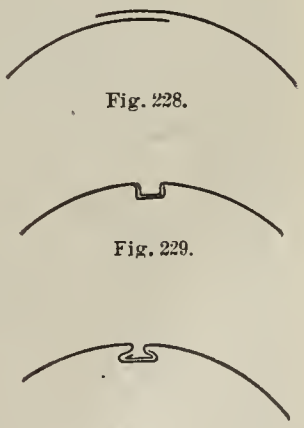


Fig. 228.

Fig. 229.

Fig. 230.

PRESS WORKING OF SHEET METALS.

elastic to approximate nearly enough to a true circle as they are forced into the lower die, and that the slits, if narrow enough, do not injuriously mark the work. The work shown in Fig. 191 fairly represents the body of an ordinary sheet iron bucket. These bodies are usually made up of one or two or more sections, seamed together in lines forming elements of the cone.

In Fig. 192 is shown a pair of dies which are the exact reverse of those just described. They are for curling the small end of conical work, as shown in uncurled and curled conditions in Figs. 193 and 194 respectively. In general, it is found better to confine the work outside for outside curling, and it is therefore placed within the lower die, as a receptacle, in the two former cases above mentioned. In this case, however, it is evident that the work could not be gotten into and out of such a die unless it opened in halves, but experience has proved that work of the kind here shown (which, by the way, fairly represents coffee pot bodies and such like articles) can be successfully curled after being slipped over the hornlike lower die pictured in Fig. 192, which seems to brace the body against buckling better than with straight work, &c. This and other dies of the same bulky character are made hollow merely to save metal, but could, of course, just as well be solid. The curling ring *d* has in this case an expanding rather than a contracting action, and is forced inward by springs, instead of outward, as in Fig. 189. It of course expands automatically as it is driven down upon the work.

In Figs. 195 to 203 and also in Figs. 208 and 209 are shown specimens of what may be called the curiosities of curling. They are combination processes, where two or more pieces, previously made of the proper shape, are assembled and fastened together, as well as given a suitable finish by various operations of curling, &c.

In Fig. 195 are shown the uncurled body, bottom and base ring of a patent coal scuttle, one side only being given and that in "slice section." In Fig. 196 the same are shown in complete section after being curled at one operation, the dies at the same stroke curling the top rim *e*, the triple joint *f* and the bottom rim *g*. Dies for such work are of course very difficult to make, especially as the top of the vessel does not lie in a normal plane, nor in a plane at all, being of the double spiral shape shown. It is, moreover, necessary to use self acting outside clamps to clamp the body securely to the horn, and also to embody vertical motions of the horn itself, and of a clamping device to hold the bottom and base ring in place.

In Figs. 197 and 198 are shown two similar stages of the operation of curling the top of a bucket and putting a bottom thereon, the latter, however, not being a curling operation, but rather a peculiar style of forming, where an upwardly projecting bead in bottom, *h*, is forced to bulge and bend over outwardly by the pressure brought upon it at the same time that the top curling is being done.

In Figs. 199 and 200 are shown similar stages of the operation of putting the bottom in a pail by a different method, consisting of double curling them together at *g*, while the top curl is being made at *e*. In this case a depression, *h*, has been made in the body in some kind of a roller forming machine.

In Figs. 202 and 203 are shown similar successive stages in the operations of putting together a sheet metal cuspidor. The curling at *e*, however, has in this case been done in a lathe, because the taper of the cone (see, also, Fig. 201) was too great for curling dies to work properly. The operations at *f* and *h* consist of a sort of a combined curling and smashing, somewhat similar to that shown in Fig. 198 At *g* and *i* the action is true curling, done in an inward direction.

In Fig. 204 is shown a pair of dies for the inward curling of a plain cylindrical body, Fig. 205, into the condition shown in Fig. 206. Sometimes this process is practicable at both ends of the work at once by double curling dies, and is well adapted for napkin rings, &c. Such dies can, of course, be arranged for real wiring if desired.

In Fig. 207 is shown a pair of dies for putting together by the process of inside curling a body and a bottom, as shown in its successive stages in Figs. 208 and 209 respectively. The function of the spring driven plate *a* in the lower die is to support the bottom when first laid upon it, but it of course descends therewith as the curling proceeds.

In Fig. 210 is shown a pair of dies for the inward curling of the large end of conical work, as shown in Figs. 211 and 212 respectively. In this case the curling ring is of course a contracting one.

In Fig. 213 is shown a pair of dies for the inward curling of the small end of conical work, as shown in Figs. 214 and 215 respectively. In this case the curling ring *d* expands.

Principles of Curling.

In analyzing the principle of the curling process we will find that it can not be practiced upon the edge of a flat sheet of metal, and that said metal must not lie in a plane but in the surface of a cylinder, or approximately so. It is therefore not practicable to curl or wire rectangular utensils or other articles having a prismatic or pyramidal rather than a cylindrical or conical form. It is true that a curling action might take place at the angles of such pyramids or prisms if they were somewhat rounded off to a curved contour, but at the sides, where the edge followed straight lines, it would simply be bent, as at the top of M, Fig 216, instead of being truly curled.

In Figs. 216 to 221, inclusive, are shown at U in vertical axial section one side of a broken away curling ring, and at M, in Figs. 218 to 221, similar sections of a piece of plain cylindrical work near its upper end, these latter pictures showing various successive stages as the die U descends in the operation of true curling.

In Fig. 216 is shown the bending action before referred to where the edge of the work lies in a straight line. Or, for the sake of illustration, let us suppose that M is a little bar of metal, standing on end, and say $\frac{1}{64}$ inch thick by $\frac{1}{4}$ inch wide, shown in edge view. It is evident that when this straight vertical bar is struck by the inclined surface of U at the point *a* and below it will be bent outward, but with a long bend, as shown, instead of a short one, as in Fig. 218. This is by reason of the ordinary principles of leverage, which cause a bar to bend as far as possible from the end where the force is applied so as to obtain more leverage for such bending, its starting point being determined in this case by the outside resistance at *b*, which is supposed to be the confining part of the lower die. If the operation is carried a little further the top end of the bar reaches a point in the die at *c*, and there is a general smash, or perhaps it is carried down in some irregular and undesired form. If, however, when it first starts to bend outward it could be confined at the point *d* on its surface and after the extreme end is bent into a short curve it could be again confined at *e*, and still later at *f*, it is evident that it would assume the proper shape and approximately follow the semicircular curvature of the die at *a*, *c*. To illustrate more plainly: supposing that we have a vessel composed of a number of the small bars M, arranged in a circle like the staves of a barrel, and supposing that we have a hoop at *d* which will confine them all until a bend is started at each of their ends, and that then it will expand and another hoop at *e* will hold them until they are again bent, when this hoop in its turn expands—and so on. Such an arrangement would evidently develop a curling operation, and the action described is what really takes place, the metal itself being at the same time its own staves and its own hoops. To prove that a square can could not be properly curled along its flat sides, it is only necessary to imagine a square barrel in which, obviously, the hoops would have but an infinitely small resistance to the expansion of the staves, except at the corners.

With inside curling the holding in action at *d*, *e*, *f*, &c., is due to the compressive instead of the tensile resistance of the metal in a circumferential direction as before. Then by analogy we have the arch instead of the hoop principle, and our little staves become the arch stones.

When the edge of a piece of metal has once been set into a curve of small radius at the extreme edge, and when the forming of the incipient curl thus commenced is gradually continued, as in Figs. 219, 220, &c., there is no action tending to straighten it out again except (in the case of outside curling) the resistance of the edge of the metal to compression as it travels inward from *g* to *h*, Fig. 221. This resistance is not, however, as has been proven in practice, sufficient to spoil the curl, which consequently progresses inward until it strikes the main body of the metal; or, indeed, if the process be continued long enough, until it goes on around in a spiral form, as shown in Fig. 222. With internal curling the circumferential stresses in the edge of the metal as it travels from *g* to *h* are of course tensile instead of compressive, but again are not sufficient to balk the curling propensities existing.

It is evident that as the edge of the metal travels outward from *a* to *c* in external curling, it must be stretched or made longer circumferentially. This, in some cases, is sufficient to crack it in a radial direction at numerous points around it. To guard against this the diameter of the curl must not be too large in proportion to the diameter of the vessel operated upon. Its behavior in this respect depends also upon the thickness and toughness of the metal. If, again, the curl itself is too large in relation to the metal's thickness, the edge does not go in properly from *g* to *h*, as was predicted for it in the last paragraph, and sometimes with the large curling used with real wire it is necessary to roll the edge down afterward in some kind of a burring machine. Especially is this apt to be the case with external curling upon work with considerable taper, like dish pans. The large diameter of the pan, the largeness of the wire which is usually

put in, the greater distance to *h* on account of the taper, and the proportionate thinness of the metal all serve to present bad conditions for true curling.

With internal curling there is less trouble in regard to the points above mentioned, but as the edge of the metal is first compressed and becomes smaller in traveling from *a* to *c*, it must be expanded and stretched in completing its journey from *g* to *h*. If tough enough it will go all right; if not, otherwise.

In practical work it is found that with ordinary tin plate and sheet iron a curl of from $\frac{3}{32}$ to $\frac{3}{16}$ inch can be obtained, according to various conditions above indicated. For larger curls to be successfully made, much thicker metal might be required.

The pressure necessary for curling is usually small, it being quite possible to do work of this kind upon tin plate in an ordinary foot press to 1 foot or more in diameter. The ram speed in running curling dies is immaterial, there being no limitations in this respect as presses are ordinarily run. The kind of press used is also immaterial, except that it must have hight enough for the depth of the dies, which is usually much greater than for work of other kinds, plus the depth of the work itself, so that it may be inserted between them and then dropped into or on to the lower die. This is assuming the lower die to be fastened to the press bed in the ordinary way, and would, of course, involve a very long stroke to the ram. In practice, however, except for very shallow work, the lower die is usually mounted upon a sliding or swinging table, which is brought forward each time the work is to be removed and replaced. It is then pushed backward under the upper die, which need have but an ordinary stroke of from 1 to 2 inches, according to the character of the particular dies in question.

Horning or Side Seaming.

Somewhat germane to the subject of curling and wiring, inasmuch as it is used in preparing utensil bodies for that process, is the operation of horning or side seaming. This also is an assembling process where two or more pieces are fastened together by press work, and is analogous to some of the putting together operations described a few paragraphs back.

In Fig. 223 is shown a front view of a round horn, L, which is, of course, in reality a lower die, and of an upper die, or so called "force," U. These, as shown, are adapted for closing down a side seam upon a cylindrical or conical body with an outside projection, as in Fig 227.

In Fig. 224 are shown a horn and force adapted for square work, rather than round. In this case the horn is grooved and the face of the force is flat, thus adapting it for an internally projecting seam like that in Fig. 226. Either form of seam can, of course, be made in either round or square work.

In Figs. 225 and 226 are shown the successive stages of an ordinary lock seam, the first showing it loosely hooked together, the hooks having been previously formed separately; and the second showing it after being struck and smashed down solidly together in the press. In Fig. 227 the same thing is shown, but with the seam projecting outwardly, as before mentioned

In Figs. 228, 229 and 230 are shown, more as a curiosity than anything else, three successive stages of a peculiar patented seam which the writer once designed a special press for, the ram being supplied with three different dies, which put themselves in position successively during three quick blows which the press gave before stopping. The horn also was provided with an automatically changing lower die. The work was placed in the machine without hooks, as in Fig. 228, the three successive blows putting it first into the shape 229, then into 230, and finally smashing it so that it looked pretty much the same as Fig. 226. This seam was a success mechanically, especially for thin metals, although somewhat wasteful. For some reason unknown to me the owners have never put it upon the market.

There are numerous other forms of special seams which do not appear to have come into practical use, and there are also some machines for making automatically the ordinary locked seam first described. These, however, it will hardly be worth while to describe here.

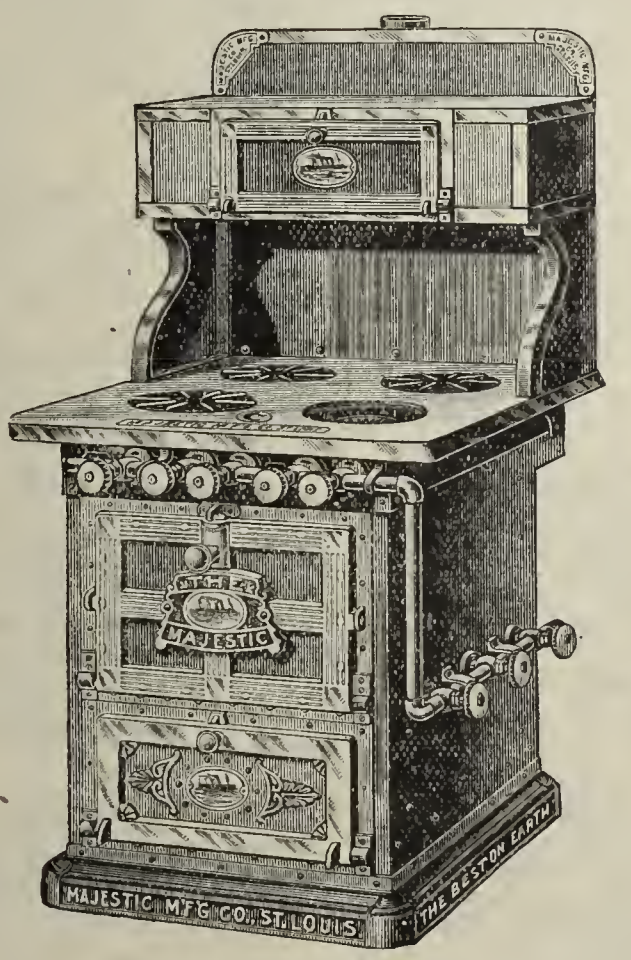
The speed used in seaming work is immaterial, although a quick hammer like blow would do the most good with a given press. The pressure required is considerable, and, within the limit of the metal's crushing strength, I should say the more the better. Again, we have no pressure measurements worthy of record.

The presses used for horning are usually special, with the projecting bed omitted from the frame, and in lieu thereof special means for inserting or otherwise fastening on horns of various sizes and shapes. For certain small work ordinary presses can be used, with horns mounted upon properly adapted bolsters.

Thomas Nevins & Son, contractors, of Orange, N. J., have contracted to purchase the entire street surface railway system of Detroit, Mich. The lines are 80 miles long, of which 30 are trolley lines. The purchasers intend to equip the system throughout with trolley lines as well as to extend it. This is one of the largest contracts in the history of electric roads.

Majestic Gas Range.

The Majestic Mfg. Company, St. Louis, Mo., have added to their already extensive assortment of gas burning appliances a new line of ranges known under the name "Majestic" These goods are made with body and oven of cold rolled steel, the oven doors, frames, hinges, stakes and handles of malleable iron, while other portions are of the best gray iron. All parts of steel and malleable iron are firmly riveted together. The illustration which we present herewith shows one of the varieties in which this line is offered to the trade. The oven is 18 inches wide, 18 inches deep and 12½ inches high, the roasting and broiling oven being of the same width and depth, but 10 inches high. The top surface of the stove measures 24 x 28 inches, and is provided with three single burners and one double burner. The air mixers are provided with cut offs admitting more or less air, as may be required. The oven is heated by inverted twin burners, which are said to produce a flame nearly sky blue in color, thus economizing fuel and utilizing to the full extent the products of combustion. All the flues are lined with asbestos board. One form of range has an attachment in the shape of a 10 gallon copper reservoir, planished outside and tinned inside. There is also provided an improved shelf warming oven, which is heated by placing a hollow cone over one of the rear burners and thus conveying the heat to the under side of the oven.



Majestic Gas Range.

In some of the agricultural districts of Pennsylvania the demand for small farms is said to be greater than has been ever before known.

PLUMBING and GAS FITTING.

Texas Master Plumbers.

The fifth annual convention of the Texas Master Plumbers' Association was held May 9 at the Hutchins House, Houston, with a good attendance of delegates from the leading cities. The association was called to order at 1 o'clock. W. W. Otter, president of the local association, introduced Mayor John T. Browne, who in an appropriate address of welcome tendered the members of the association the hospitality of the city. President May in a befitting manner responded on behalf of the association.

The Executive Committee was appointed a Committee on Credentials and reported the following cities represented: Austin—W. A. Burke, Teagarden & Co. Dallas—F. A. Campbell, D. F. Sullivan, S. C. Carroll, Ed. S. Davis San Antonio—A. H. Shafer, Ed. Braden, Jr., Rudolph Strohmeyer. Corsicana—F. S. Brooke. Fort Worth—Geo. D. Ackley, J. F. Osborne, George Preuitt, J. B. Austin, Jas. Barry. Houston—W. W. Otter, R. B. Morris. Galveston—D. J. May, Paul Shean. Waco—J. S. Brazelton. Sherman—J. F. Madden, O F. Johnson. Tyler—Thomas Henderson.

The officers elected for the ensuing year are: President, Ed. Braden, Jr., of San Antonio, vice-president; W. A. Burke of Austin; secretary, J. F. Osborne of Fort Worth; treasurer, A. H. Shaper of San Antonio.

Executive Committee—R. B. Morris, chairman, of Houston; D. J. May of Galveston and W. W. Otter of Houston.

Delegates to the National Convention—President, Ed. Braden, Jr., *ex officio*, of San Antonio; George D. Ackley of Fort Worth; A. H. Wainwright of Galveston; J. F. Madden of Sherman and Thomas Henderson of Tyler. The delegates go uninstructed.

A committee was appointed to revise the constitution and by-laws and put them in such shape that they can be published in pamphlet form for the use of members of the association. This committee had a lengthy meeting and a general discussion over the proposed work.

The local association gave a banquet at the Hutchins House in honor of the visitors.

Massachusetts Master Plumbers.

The annual meeting of the Massachusetts State Association of Master Plumbers was held at the Hamilton House, in Holyoke, last week. There were about 100 persons present, including 64 regularly accredited delegates from local associations. The officers of the association met early in the forenoon, but the main body of the members did not arrive until nearly noon. The session was devoted to the election of officers and a few technical details of work connected with the business represented, and a fine dinner. In the absence of the president of the association, Vice-President Jordan of Worcester presided and Daniel Shannon of Boston was clerk. Charles H. Tower of Holyoke was chosen sergeant at arms for the session. T. J. Carmody of Holyoke was chairman of the Committee on Credentials, and it was found that 64 were properly accredited. The report of the treasurer showed receipts of $218 and expenses of $119 in the year.

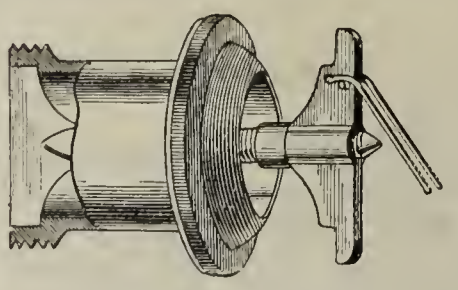
After the preliminary business adjournment was taken for dinner. The association went into executive session after dinner and discussed matters of interest only to the members. The committee appointed at a previous meeting to prepare a bill governing plumbing methods and secure its passage by the Legislature reported that the matter was progressing favorably. These officers were elected for the ensuing year by unanimous vote: President, W. H. Mitchell of Boston; vice-president, J. W. Green of Worcester; recording secretary, Daniel Shannon of Boston; financial secretary, C. P. Lyman of Holyoke; treasurer, E D. Casey of this city; Executive Committee, J. W. French of Boston, T. J. Gifford of New Bedford, R E. Fogwell of Fall River, J F. Davelin of Somerville and O. S. Kendall of Worcester.

T. J. Carmody and D. D. Casey were chosen delegates to the national convention, and C. P. Lyman and J. F. Kennelly alternates. The association will make an effort to organize the various associations throughout the State.

Votes of thanks were passed to the officers and the Holyoke association for the work that they had done in preparing for the meeting, which then adjourned.

Closet Repair Coupling.

In a recent number of *The Metal Worker* appeared an illustrated description of a closet repair coupling intro-

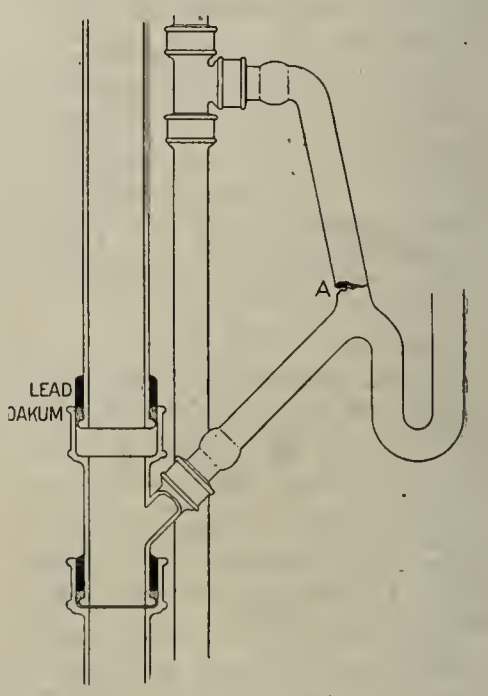


Closet Repair Coupling.

duced by Savill, Walls & Co. of 1229–1231 Budden Row, Philadelphia. The accompanying illustration shows another coupling put on the market by the same firm and designed for use where the old supply pipe and coupling are to be utilized, thus obviating the necessity for any change in the fitting of the closet. The coupling consists of a brass supply arm having a flange at one end over which fits a rubber washer with a raised tapered center. A T headed brass locking bar, screwed at its end, passes through the center of the arm and engages with a brass cross bar to which is attached a spring. The outer end of the arm is screwed with a 1¼ inch iron pipe thread, and its inner surface is recessed in order to provide a seat or stop for the head of the locking bar. In use, the cross bar is removed from the locking bar and inserted in the waterway or flushing rim of the closet; the supply arm is then placed in position and the locking bar passed through it and screwed by means of the T head into the cross bar until the recess or seat in the arm prevents further turning, when a tight and flexible joint will have been effected. The coupling may also be used on new or old closets where an economical and flexible coupling is required. The coupling is made in two styles, screwed for iron pipe, as in cut, and plain for lead pipe.

Defects Discovered by a Smoke Test.

The accompanying illustration shows a part of a plumbing system brought to our notice by Boyd & Schnaier, 347



Defects Discovered by a Smoke Test.

Columbus avenue, New York, and found in a residence where they made a smoke test. The defects shown were in different parts of the building, but for convenience they are connected in the illustration. In each ample opportunity is afforded for the entrance of sewer air. The first defect and the one more likely to happen is due to the settling of the soil pipe. The lower section of the pipe had settled sufficiently to almost entirely draw away from the upper section, so that the lead which had been calked in the joint to make it tight was nearly drawn out, leaving nothing but the oakum to prevent the entrance of sewer gas. Under the test smoke freely came through this joint. The settling in the soil pipes below the fixtures is more probable than in the pipe above them, from the fact that the lower pipe has to support more or less of the weight of the upper pipe and resist the force of the water which is discharged into it. A

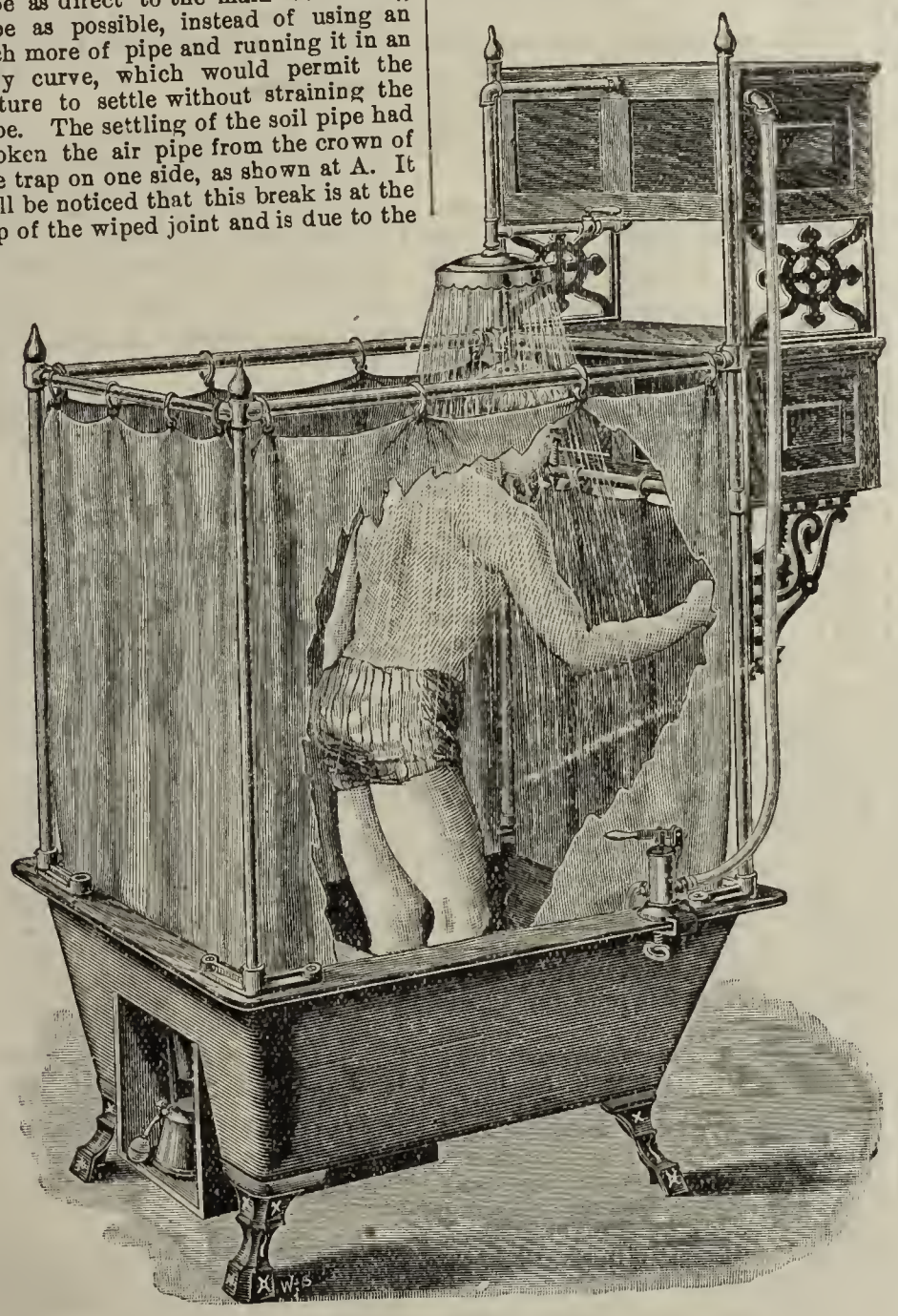
continuous downward blow is struck on the side of a pipe by the discharge of water from a water closet, which can be estimated at several pounds, and for a period of a minute or more, according to the size of the flush tank, from which some idea can be gained of what causes such pipes to settle. In buildings where the fixtures are used frequently the probability of the pipe settling becomes greater.

The other leak is shown at the crown of the trap under the lavatory and is due to two causes: In the first place the plumber in making a neat looking job, and to save pipe, runs the back air pipe as direct to the main ventilating pipe as possible, instead of using an inch more of pipe and running it in an easy curve, which would permit the fixture to settle without straining the pipe. The settling of the soil pipe had broken the air pipe from the crown of the trap on one side, as shown at A. It will be noticed that this break is at the top of the wiped joint and is due to the care of the plumber to do a neat job. In soiling this pipe and shaving it for the joint, in order to have a clean, well defined line around it, in all probability he used his dividers to mark the line around the pipe, and in doing so made a deep scratch in marking the pipe. This scoring made a weak point in the pipe. It has been clearly shown by experiment that an ordinary scratch on a piece of sheet lead will cause it to break along that line very regularly, while a piece of sheet lead that has no mark on it when pulled apart would require more force and would show a very irregular and ragged fracture.

The Smith & Anthony Company, 56 Beekman street, New York, in addition to their line of Sanitas plumbing appliances, are showing samples of the Oswego Indurated Fiber Company bathtubs and foot baths. In one of their windows a new attraction is an Italian marble lavatory fitted with bronze Sanitas trap, and bronze pipe with a patent Sanitas basin waste and red metal basin cocks.

Combination Bathtub.

We show in the accompanying illustration a combination bathtub made by the Ette & Henger Mfg. Company, St. Louis, Mo. The bath, it will be noticed, is self heating, and in addition, the manufacturers point out, will give, singly or in combination, any of the following baths: Hot water, cold water, hot air or steam, dry or wet vapor, alternating hot or cold, or plain, perfumed or medicated, spray, douche, syringe or bidet baths, and in addition has an adjustable stool with comfortable lazy back, which by a simple arrangement will automatically rub the back with either brush, sponge, towel or electrode. The heating is done either by a gas or gasoline heater adapted to heat from 12 to 18 gallons in from 15 to 20 minutes. The tubs are made of aluminum and polished inside and outside and with similar trimmings and hardwood finish to suit. The general baths are made of cast iron, painted with a special enamel to resist heat, and with trimmings of brass, nickel plated, and hardwood finish in imitation of cherry. Water can be brought to the tubs by pipes or buckets, or can be pumped from cisterns, if not too far off, by the pump clamped on to the rim of the tub. The bath illustrated has a vapor curtain.



Combination Bathtub.

Pipes and Electricity.

Plumbers will be interested in the following conclusions given by Isaiah H. Farnham in an exhaustive paper on the destructive effect of electrical currents on subterranean metal pipes, which was read before the American Institute of Electrical Engineers:

1. All single trolley railways employing the rails as a portion of the circuit cause electrolytic action and consequent corrosion of pipes in their immediate vicinity, unless special provision is made to prevent it.

2. A fraction of a volt difference of potential between pipes and the damp earth surrounding them is sufficient to induce the action.

3. Bonding of rails, or providing a metallic return conductor equal in sectional area and conductivity to the outgoing wires, is insufficient to wholly prevent damage to pipes.

4. Insulating pipes sufficiently to prevent the trouble is impracticable.

5. Breaking the metallic continuity of pipes at sufficiently frequent intervals is impracticable.

6. It is advisable to connect the positive pole of the dynamo to the trolley lines.

7. A large conductor extending from the grounded side of the dynamo entirely through the danger territory and connected at every few hundred feet to such pipes as are in danger will usually insure their protection.

8. It is better to use a separate conductor for each set of pipes to be protected.

9. Connection only at the power station to water or gas pipes will not insure their safety.

10. Connection between the pipes and rail or rail return wires outside of the danger district should be carefully avoided.

11. Frequent voltage measurements between pipes and earth should be obtained, and such changes in return conductors made as the measurements indicate.

In closing this somewhat rambling paper, I can do no better than use words which will remind you of Patrick Henry—"eternal vigilance" will be the "price" of pipes and cables where conditions favorable to electrolysis exist.

TRAPS AND VENTS.

Garrett D. Voorhis died at his residence at Paterson, N. J., at the age of 64 years, last Monday. He had carried on a stove and plumbing business in that city for a number of years. He was a director in the First National Bank and the Paterson Savings Institution. He was also an active worker in the Young Men's Christian Association, having recently donated $1000 to its building fund. He is survived by a widow and a daughter.

The American Tube Works, Boston, Mass., are sending out a 34-page pamphlet devoted to their seamless drawn brass pipe for plumbing. It gives a list of sizes and weights and states that they are tested to a hydrostatic pressure of 1000 pounds per

square inch. This is followed by a brief description of the pipe, and the remaining 24 pages gives the names of prominent plumbers in different cities who have used the brass pipe and a number of public buildings and private residences in which it has been put.

A. A. CASWELL and John Dickson have formed a copartnership and entered into the plumbing business with headquarters on North street near the junction of Essex, Salem, Mass.

SAMUEL A. STEVENS, the veteran plumber, at Salem, Mass., has retired from business, and has been succeeded by Staten & Tyler.

GEORGE M. ELLIS has purchased his partner's interest in the plumbing, steam and gas fitting business of Ellis & Hull, at 258 Franklin street, Norwich, Conn., and will continue the business himself.

AT THE LAST MEETING of the Master Plumbers' Association, held at their meeting rooms, Builders' Exchange, 19 West Saratoga street, Baltimore, Md., the following officers were elected for the ensuing year: E. J. Healy, Jr., president; P. T. Barry, first vice-president; G. W. Addison, recording secretary; C. H. Frederick, financial secretary; D. N. Sullivan, treasurer. The following delegates were elected to represent the association at the thirteenth annual convention, to be held at Detroit, Mich., June 19 next: John Trainor. W. H. Rothrock, Geo. Knipp, H. C. Bowman, E. J. Healy, Jr., J. F. P. Carey, D. N. Sullivan, C. H. Frederick.

CHAPTER 419, section 114, of the Massachusetts laws of 1892 provides that "every school shall have at least one water closet or privy for every 20 persons therein attending. . . . Privies or cesspools shall not be allowed when a sewer makes water closets practicable." The citizens of Roslindale are remonstrating against the use of a school building which has but two water closets for 100 pupils.

JARRATT & ABEL are a new firm at Macon, Ga., who will carry on a plumbing and tin business. The firm is composed of R. P. Jarratt, who established the business, and F. T. Abel, who has purchased an interest.

THE COMMON COUNCIL of Pawtucket, R. I., have passed a new ordinance in reference to plumbing in that city.

N. MEREDITH has removed his plumbing shop from Church street to 5 South Perry street, Johnstown, N. Y.

THE FIRM of Snoddy & Cook, plumbers, Hamilton, Conn., have dissolved.

JAMES CHAPMAN, a practical plumber, recently in the employ of John Downing, has engaged in business for himself with shop at E. E. Johnson & Son's stove store, South Laurel street, Bridgeton, N. J. He will do all kinds of plumbing and steam and gas fitting.

THE HIGHOATE MUSEUM of Sanitary Appliances, in London, to which reference has several times been made, is being utilized in a very practical way for the benefit of plumbing and other students, classes of whom from trade and technical schools visit the museum from time to time and are there given lectures on sanitary subjects, illustrated by the object lessons at hand.

THE PLUMBERS' REGISTRATION BILL which has been experiencing a troubled passage through the British House of Commons, owing to the opposition of the ironmongers, whose "side line" interest in plumbing was threatened, is now awaiting the second reading in the House, with a good chance of passing into law. The promoters of the measure have inserted a clause giving registration without examination to ironmongers now engaged in the plumbing business, and the block placed in its way by the influence of that trade has been withdrawn. The bill has still some other obstacles to contend with, however, and unless these are removed it may not pass in the present session of Parliament. The Braziers and Sheet Metal Workers' Union object to some features of the bill, and these objections are now under consideration by the promoters.

"WE USE nothing but absolutely pure lead in the manufacture of our lead pipe, and pure lead and pure tin in the solder that we sell," is the claim of the National Lead Works of 287 Pearl street, New York.

DENNY BROTHERS, 36 Park place, New York, are issuing a 20-page catalogue of Denny's Imperial gas machine. The book is profusely illustrated with cuts showing the method of applying their machine for manufacturing gas to residences and buildings in localities where there are no large gas works. A full detailed description is given of the operation and working of the machine and the method of setting it up for use. It is stated that their gas may be used equally well as coal gas for mechanical and heating purposes. A cut is shown of their Imperial gas burner, designed for use in connection with gas machines. The book also shows the Dunning steam and hot water boiler for house heating, for which they are the New York agents.

A MEETING of the Executive Committee of the Illinois Master Plumbers' Association will be held Monday, May 21, at 10 a.m., in the rooms of the Chicago Master Plumbers' Association, 197 Madison street, to arrange for a convention of the master plumbers of Illinois to consider means of increasing the membership of the State Association. Invitations to attend have been extended to the executive committees and presidents of local associations throughout the State.

THE FOLLOWING DELEGATES have been elected to represent the Master Plumbers' Association of Philadelphia, Pa., in the national convention of plumbers, to be held at Detroit, beginning June 19: William McCoach, William H. Doyle, George F. Uber, Frank P. Brown, John E. Eyanson, William L. Owens, William Harkness and Samuel W. Barnes.

E. RAYMOND, one of the representatives of Henry Huber & Co., 81 Beekman street, New York, is well known to the plumbing trade in New York and vicinity. Having had several years' experience with a kit of tools, he is well qualified to present the merits of the plumbing goods manufactured by his house. On water closet construction he is well informed and thinks that the Americans are far in advance of all competitors in the design and finish of earthenware closets.

PATRICK J. HART and Daniel E. Shea have opened a plumber's shop at 10 Putnam street, Fitchburg, Mass., under the firm name of Hart & Shea.

THE PLUMBING FIRM of Honan & Leddy, New Britain, Conn., are open for business.

LAST SATURDAY EVENING Frank A. Wendell opened his new plumbing establishment in the Kinsman Block, Salem, Mass. A large number of visitors inspected an endless variety of articles used in the business. One of the most attractive portions of the exhibit is in the front window, being a complete bathroom, arranged according to the latest ideas. Hot water heating apparatus is set up and shown as in use, with radiators, &c. An elegant line of gas and electric chandeliers with handsome lamps is also exhibited, with globes of all kinds, faucets and kindred articles. A complete outfit for a dwelling house, as far as plumbing is concerned, is in operation. Mr. Wendell has an office in the front of the store, with speaking tube connections with the work rooms, which are located in the rear and in the spacious basement.

THE HARTFORD ASSOCIATION OF MASTER PLUMBERS has elected the following officers for the ensuing year: President, George Mahl; vice-presidents, Edward Mahl, Thomas Oakes; recording secretary, J. J. Lawler; corresponding secretary, George S. Bull; treasurer, E. Lawler; financial secretary, W. B. Hogan; sergeant at arms, Charles Murray.

ALEX. MURRAY has opened a plumbing and gas fitting store in Newburg, N. Y.

Chicago Delegates.

The Chicago Master Plumbers' Association, at their regular meeting on the evening of the 14th inst., elected the following delegates to attend the annual convention of the Master Plumbers' Association of the United States, which will be held next month in Detroit:

Delegates.	*Alternates.*
C. J. Herbert.	D. M. Quay.
P. Sanders.	R. B. Finn.
T. P. Culloton.	Thos Conlin.
G. A. Larson.	John Sanders.
Thos. Conway.	Chas. Byrne.
Chas C. Breyer.	J. H. Killian.
D. J. Rock.	David Whitford.
P. M. Murphy.	A. F. Irons.
A. C. Hickey.	Jno. Gannon.
John G. Roland.	P. J. Morrisey.
Jos. B. Breen.	T. C. Boyd.
M. L. Mandable.	J. H. Beam.
E. Baggot.	J. A. Voltz.
Jas. H. DeViney.	J. C. Cederholm.
Jas. H. Roche.	J. Nelson.
W. H. Cummins.	M. J. Carboy.
A. W. Murray.	
Jacob G. Weber.	
J. J. Doyle.	
B. H. Lear.	
J. P. Neurberg.	
C. J. Boyd.	

Additional Chicago delegates by virtue of their office are the following: Andrew Young and Robert Griffith, ex-presidents of the National Association; J. J. Wade, member of the national Executive Committee; W. T. Geary, State vice-president; Paul Redieske, president Chicago Master Plumbers' Association.

Clement A. Griscom, president of the American Steamship Line, describes the prospects for transatlantic cabin passenger traffic this year as being favorable for a better business than last year, although any large increase is not expected. The prospects for steerage business he thinks are not so satisfactory.

The shareholders of the Panama Canal Company, at a recent meeting in Paris, appointed a committee to establish a new company for the purpose of completing the canal.

STEAM AND HOT WATER.

Master Fitters' Convention.

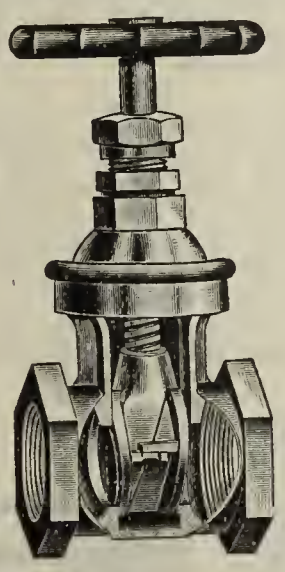
The following call for the sixth annual convention of the Master Steam and Hot Water Fitters' Association of the United States will be mailed generally to steam fitters and manufacturers about June 1. The call is signed by the Executive Committee, consisting of J. L. Wells, James Curran, Andrew Mercer, E D. Smith and J. D. Clarke; also by President E. Rutzler and Secretary Geo. H. Reynolds, whose address is the Broadway Central Hotel, New York:

The sixth annual convention of the Master Steam and Hot Water Fitters' Association of the United States will be held at the Broadway Central Hotel, New York City, commencing Tuesday, June 19, 1894, at 10 o'clock, a.m. A cordial invitation is extended to all master fitters to attend this meeting, whether members or not. We urge each and every one who receives this communication to make inquiry of others of the craft and to advise any whom this has failed to reach that they are included in the invitation. Reading of papers by members has been an attractive and successful feature of our last two conventions. By referring to the various trade journals you will see our announcement giving subjects and authors of articles promised for this annual meeting. New York City with its diversified interests is attractive at any season of the year. On June 15 the numerous summer resorts in and about the city will be open to the public and can, after final adjournment, be visited by those who desire to do so. The Broadway Central Hotel is located on Broadway, between Bleecker and Third streets, and is in its appointments well adapted for holding conventions. The accommodations are first-class and ample. For rates see return postal card, which please fill out and mail. Railroads have granted full rates going and one-third returning by same route. Secure your certificates when buying your tickets and have them properly indorsed at the meeting. Local ticket agents will be instructed and can give full information. The usual entertainment will be arranged for the ladies, which we hope they will be here in increased numbers to enjoy. Those desiring to make exhibits of their goods at the convention can get particulars by addressing the proprietors of the Broadway Central Hotel. Many have already secured space, which emphasizes the importance of the meeting.

THE HERENDEEN MFG. COMPANY, Geneva, N. Y., distribute circulars illustrating the Furman Junior hot water boiler. A general view is shown of the apparatus, together with interior and other views. The Furman Junior is adapted for supplying hot water for conservatories, small dwellings, baptisteries, poultry houses, stables, bathtubs, carving tables, laundries, &c. The water section is cast in one piece and no brick work is required.

Diamond E Gate Valve.

The gate valve shown in the accompanying cut is placed on the market by Ette & Henger Mfg. Company, St. Louis, Mo. In construction, the principle of the body and disk is of the usual order, but having a diamond shaped wedge, tapered and higher in



Diamond E Gate Valve.

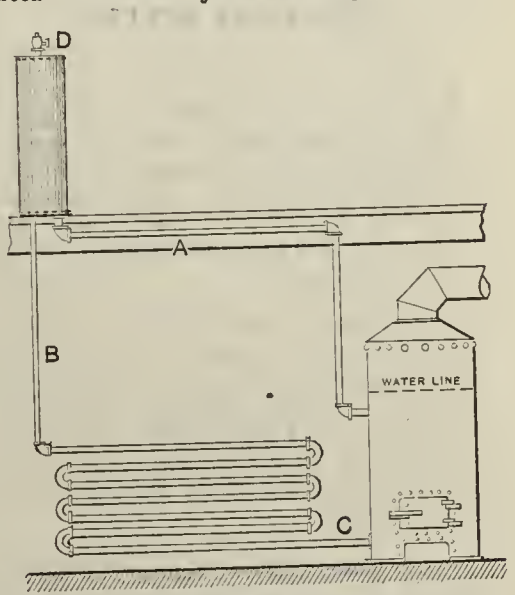
the center than at the ends to insure a perfect seat and to overcome grinding. It is stated that each valve is tested to 300 pounds pressure and guaranteed to be perfect in all respects. These are made in regular sizes from ¼ inch to 6 inches.

The Raymond & Campbell Mfg. Company

of Middletown, Pa., have just issued a 102-page catalogue descriptive of the Lindemuth Sun steam and hot water heaters. The catalogue is oblong in shape, and appears in buff paper covers, the front page bearing a lithographed title, with a cut of the boiler on an outstretched hand, and the motto: "The Pride of the World." The first inside page bears the company's card with a list of their agencies and a view of their works, the latter contained within a scroll of handsome design. The second page is taken up with an announcement declaring that the aim of the company is to build and place on the market a superior article embodying the features most desirable in a heating boiler. The catalogue proper leads off with a description of the advantages of the Sun and the details of its construction, and there are shown illustrations of the base and fire box, drop tubes and top; other cuts show the position of the fire tubes as located in the water and steam space, and the method of placing and the position of the fire tubes and drop tubes. The Sun steam boiler is described at length and fully illustrated, and the qualities of the Sun as a heavy duty or closed tank system hot water circulator ably enumerated. The Lindemuth Sun steel sectional steam and hot water boiler is also shown, and the difference between its construction and that of the regular boiler explained. Page 16 shows the adaptability of the Sun as a brick set heater, and two diagrams are furnished in demonstration of same. About 20 pages are devoted to price-lists of the boilers, heating supplies, a telegraph and cable code, and directions for the proper attachment and use of the thermometer recommended for service with the boilers. The remainder of the book is taken up with *fac-simile* testimonials received from users of the boilers, and upward of 80 photographic reproductions of the houses and buildings to which the testimonials refer.

Hot Water Heating From Steam Boiler.

From REX, *Rochester, N. Y.*—The heating of hot water radiators from a steam boiler may be a novelty to some



Hot Water Heating from Steam Boiler. —Fig. 1.—Radiator Below Water Line.

of the readers of *The Metal Worker*, but it is sometimes done. It is a practice to which there are objections, however

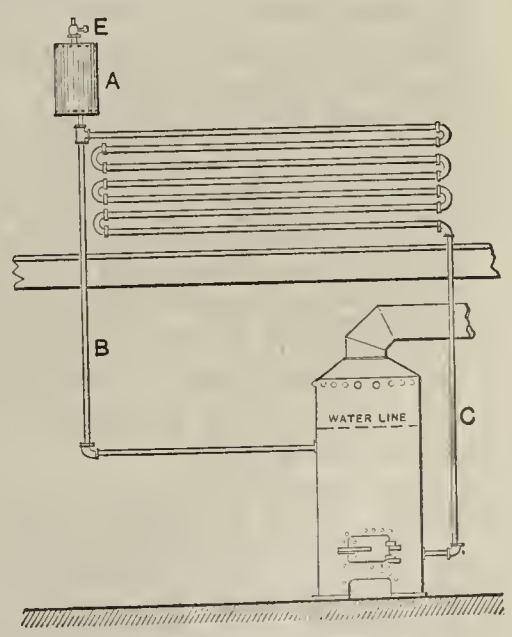


Fig. 2.—Radiator Above Water Line.

and should only be used to meet special requirements. Fig. 1 shows a radiator placed below the water line in the boiler. Fig. 2 shows a radiator above the wate

line in the boiler and when so placed the piping must be perfectly air tight. The air must be exhausted from the air chamber in both systems. One of the objections to this kind of heating is the difficulty experienced in keeping the system air tight. If not kept air tight there will be no circulation except when the steam pressure is sufficient to raise the water into the air chamber. In Fig. 1, A shows the flow pipe to the air chamber, D is an air cock and B shows the pipe from the chamber to the radiator and C shows the return to the boiler. In Fig. 2, B is the flow pipe, A is the air chamber, E is an air cock and C is the return pipe from the radiator. The heating of the water for the radiator will detract from the capacity or rating of the boiler about the same as though the radiator was heated by steam under the same conditions.

Note.—As an unusual practice the method shown will be interesting to many of our readers. There are doubtless other methods of doing the same thing and we hope those who have such systems at work will send us sketches and description.

HEATING NOTES.

The Standard Radiator Company, Buffalo, N. Y., issue some neat and tasteful circulars relating to the goods of their manufacture. One is given up to the Standard indirect radiator for steam or hot water. A half-tone engraving shows the appearance of the radiator and a few descriptive particulars accompany the cut. The three other circulars of which we have received copies relate to the New Standard radiator for steam or hot water and the Standard radiator for steam or hot water. The new Standard is likewise illustrated on a special heavy card which presents a half-tone engraving of the radiator and the name and address of the company.

The Smith & Winchester Company, Boston, Mass., send out circulars to the trade announcing the decision in the competition respecting the name of their new heater. The name selected by the judges is Winchester, this name being suggested by 52 different persons among the competitors. The first one received was from Charles O'Grady, Marlboro, Mass., who is entitled to the heater which was offered as a prize. Nine hundred and forty-two replies from the trade suggesting names were received and 329 different names were the result. The Smith & Winchester Company send out a letter giving the decision of the judges and a list of the names to the trade. The new heater is constructed entirely of cast iron, the water connections being made by screw joints, being furnished with an anti-clinker dumping grate, and is an easily erected apparatus. The manufacturers will soon issue a catalogue containing a full description of the Winchester, with cuts, and they hope to be able to fill orders by about June 1.

William Campbell, formerly of the Detroit Heating & Lighting Company of Detroit, Mich., and latterly manager of the steam and hot water department of the house of Sherman S. Jewett & Co. of Buffalo, N. Y., has accepted the management of the steam and hot water department of the Carton Furnace Company, Utica, N. Y., and Chicago, Ill., and will assume his duties at once. Mr. Campbell has had an experience in this line of business for the past 32 years, both in this country and abroad.

C. F. Bachler of 49 North Seventh street, Philadelphia, general agent for the Monitor wrought steel coil boiler, is sending out a folder containing a list of buildings and places where Monitor boilers are in use. The list is 9 feet long, and is contained in a stiff paper case, on the outside of which appears Mr. Bachler's card, and on the inside sectional and other views of the boiler.

The Board of Trustees of the Soldiers' Home, at Roseburg, Ore., selected and specified a Royal hot water heater for heating the home, which, as stated in *The Metal Worker* April 28, will be installed by the Dugan Bros. Plumbing & Heating Company of Salem, Ore. This firm, we understand, handle the boilers of the American Boiler Company, and install them unless the specification calls for some other apparatus.

Henry A. Gouge of the Gouge Heating & Ventilating Company, 47 Beekman street, New York, has just returned from Washington, D. C., where he had been consulting with some experts on the ventilation of the Houses of Congress with a view to securing better ventilation.

The John Simmons Company, 106-110 Centre street, New York, are sending the following letter to the trade: "Having leased the building 7 and 9 Franklin street, in rear of above address, and greatly enlarged our stock of cast and malleable iron fittings, including all reducing sizes, both in black and galvanized, erected a large pipe warehouse at 381 South street, besides adding to our equipment of pipe cutting machines and increasing the facilities of our machine shop, we believe we have unequaled facilities and are now in a position to sell at the lowest possible prices, while at the same time we propose to keep up the standard of our goods, on which we have made our reputation. We carry in stock standard full weight pipe, extra heavy fittings, valves, &c., specially adapted for mills, factories, refineries, and such as are used in steam, water, gas, oil and electrical engineering. We carry a full line of steel pipe specially adapted for bending. We invite your correspondence, or would be pleased to have you call on us for prices."

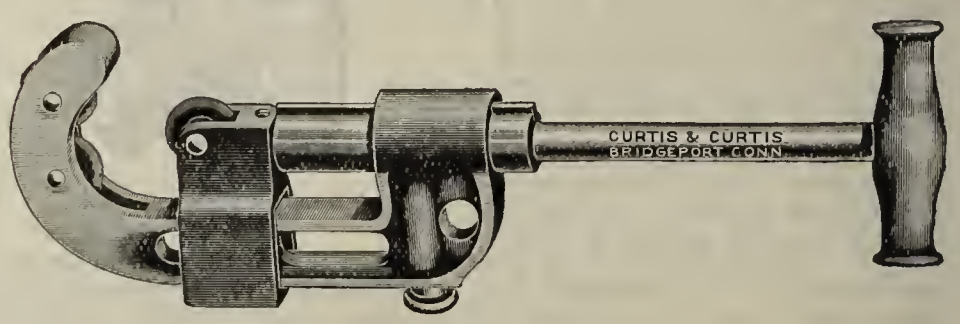
Morse Burtis, 52 John street, New York, manufacturer of valves, fittings, &c., has taken a suit of offices in the front of the building heretofore occupied by him, and on the same floor, giving much more commodious quarters.

A charter has been granted at the Pennsylvania State Department to the Sperl Heater Company of Carbondale, Pa.; capital, $20,000.

Robert Giffen, the eminent English statistician, has just issued a table comparing the trade of England, France, Germany and the United States in the period from 1890 to 1892. This table shows that the imports and exports have increased as follows: Imports—Germany and the United States, 33 per cent. each; England, 13 per cent., and France, 6 per cent. Exports—United States, 26 per cent.; France, 14 per cent.; England, 10 per cent., and Germany, 15 per cent.

Curtis Pipe Cutter.

Curtis & Curtis, Bridgeport, Conn., have placed on the market a new pipe cutter, a general view of which is shown in the accompanying illustration. A special feature of this tool is its simplicity, and several merits are claimed for this device by the manufacturers. The general principle is the same as in other three wheel cutters, except that in this there is a very simple and quick adjustment which will save time to the operator. Instead of having the screw run through the body of the cutter it is run through a sleeve, which in turn slides in the body and is held by a spring pawl. Thus, in operating, the lengthy process of adjusting the cutters to the size of pipe to be cut is avoided by simply sliding the sleeve along until the wheel is against the pipe, when a few turns of the screw, while the cutter is revolved, cuts it off.



Curtis Pipe Cutter.

We learn from the Excelsior Steel Furnace Company, Chicago, Ill., that they have received advices from Washington that all their claims on their double seaming pipe machine have been allowed, and that patents will be issued on it.

The Philadelphia & Reading Railroad shops at Reading, Pa., have just turned out a monster steam whistle which, it is calculated, can be heard at a distance of 30 miles. The whistle is made of brass and is 3 feet long. It is intended for the power house at the Gordon Planes, Schuylkill County, Pa., its use being to obviate the necessity of the employees of the road traveling a long distance to ascertain whether the Planes will be put in operation at any time. The whistle will announce the hour for the men to report, the number of blasts indicating the hour.

One of the most lofty of the new down town "sky scraping" buildings in New York City is about to be put up at the corner of Nassau and Spruce streets, by the American Tract Society. The building will have 23 stories, and its total hight will reach about 300 feet. The cost is estimated at close on $1,000,000, and it is expected to be ready for occupancy by May 1, 1895. The hight of the new office buildings is only exceeded by the celerity with which they are run up.

TIN PLATES.

Condition of the Tin Plate Trade.

The tin plate trade is in a very singular condition. From the importers' standpoint it is exceedingly dull, with no immediate prospects of improvement. On the other hand, domestic manufacturers report an active demand for every pound they are able to produce, whether of bright or roofing plates. Both agree, however, in reporting prices stationary and with apparently no tendency to advance. Western jobbers are complaining of a restricted supply of roofing plates, which is giving them some inconvenience in meeting the demands of their customers. They are consequently applying to Eastern works that have heretofore done but little business in the West. to see whether shipments cannot be made more promptly. But they do not find mnch relief in that direction, as Eastern works are being driven as hard to meet the wants of their regular trade as the Western works. The situation is singular, inasmuch as importers are deriving so little benefit from an undoubted shortage in the supply.

The trouble is, of course, directly caused by the threatened tariff legislation, assisted to some extent by the depression in business of last fall and winter. Under ordinary circumstances, with no redncton in duty pending, contracts would have been made abroad in the fall months for tin plates to be delivered here during February, March and April, to meet the regular spring demand. But with a possibility of a heavy reduction in the duty, which last fall was expected to be made early this year, such orders for foreign plates were not placed. Merchants would not take the risk of a serious loss on the stocks they might have on hand in such an event. In the mean time, also, domestic tin plate factories had increased their facilities considerably, and merchants found that they could order small quantities as required by their trade, and avoid locking up capital in large stocks in their own warehouses. Even those who had been prejudiced against domestic tin plates were impelled by the business depression to turn to the domestic makers and take small lots in frequent shipments from the factories. Until very recently this worked well. The limited trade in progress was fairly supplied and there was no trouble. But now the consumption has greatly increased with the advance of the building season and the improvement in general business, and the domestic supply falls short of meeting the necessities of the trade. Imported stocks are not here to fall back on, but the danger of tariff reduction is more imminent now than it was six months since, so importers are more fearful than ever of incurring loss if they put themselves in shape to meet the rising demand.

Another feature has also developed which should receive consideration, as it is having an influence on the course of trade. The quality of American tin plates generally is so good that consumers prefer them, ask for them, and take imported plates with reluctance if they cannot get domestic. A short time since, before it was seen that there might be a shortage, a large Western jobbing house decided to handle only American plates, and its traveling men were instructed to run off the small stock of imported plates then on hand. They were told that the new stock would be American. and they surprised the house by the vigorous way in which they applied themselves to get rid of the foreign plates, because, as they said, their customers had for a long time so greatly preferred American plates that they had been handicapped in not being in a position to regularly offer them.

The domestic tin plate manufacturer is reaping the greatest benefit from the present situation among all concerned. Threatened with a severe cut in the duty which now protects his product, it might well be imagined that his natural condition would be one of suspense and indecision, planning meanwhile how to arrange his affairs so as to continue his business existence after the blow falls. But, curiously, he is probably kept too busy by the trade steadily coming his way to give very much thought to the futnre. He is making hay while the sun shines, and as the grass is growing very luxuriantly just now and the sun is shining on him very brightly, he can postpone indulgence in anxious care until the clouds are really overhead and the storm is beating down. Of all manufacturers the tin plate makers are probably the only ones who are actually deriving increased bnsiness by reason of the great delay in tariff legislation.

SCRAP.

WE ARE OFFICIALLY ADVISED that the report that the plant of the Ellwood Tin Plate Company, Ellwood City, Pa., had been closed down on account of lack of coal is untrue. The plant is still in operation, but, like nearly all other concerns, will probably close within a short time unless a settlement of the coal strike is obtained.

THE AMERICAN TIN PLATE MACHINE & MFG. COMPANY, Linfield, Pa., have their plant in full operation, turning out 10 tons per day of finished plates. The concern have recently closed a contract for the sale of their entire output for some time to come. This fiim are owners of the Buckman automatic continuous seaming and tinning machines.

AN ENGLISH EXCHANGE states that the plant for two additional tin mills has been shipped from Wales to be laid down at the Morewood & Co.'s tin plate works at Gas City, Ind.

THE VARIOUS TIN PLATE WORKS in Monmouthshire and Glamorganshire, owned by P. S. Phillips, the well-known Welsh tin plate manufacturer, are, it is announced, to be placed under the control of a limited liability company who have been registered with a capital of $1,000,000. The style of the company is P. S Phillips, Ltd., and it will acquire the well-known Pontymister Steel and Tin Plate Works, near Newport, where the bitter strike raged for so long ; the Waterloo Tin Plate Works; the Abertillery Iron and Tin Plate Works; the Lion Tin Plate Works; Nantygle, &c. P. S. Phillips remains one of the directors of the new company, together with P. C. Phillips and F. A. Phillips.

THE BUSINESS of Hall & Carpenter, Philadelphia, carried on by the late J. Augustus R. Hall, has been purchased from the executors by Zachary T., Walter F., Harry B., and Willis E. Hall and Thomas B. Harper, who will continue the business at the old stand and under the old firm name of Hall & Carpenter. Their lines of tinsmiths' and stovemakers' supplies are well known to the trade. Their brands of roofing slates, including Hall's G. D. C., an old style plate, Killey, Seres and Argus, are also well known to consumers and are in active demand. Besides roofing plates they keep in stock some standard manufacturers' brands of bright plates, and are well able to satisfy the trade in this line. The members of the new firm are all good business men and competent to sustain the excellent reputation of the house.

GUMMEY, SPERING & Co. of Philadelphia, the selling agents of the well-known Gilbertson's old method terne plates, will carry a much larger stock of these goods in future, their new quarters providing ample space for the purpose.

BLACK DIAMOND TIN PLATE WORKS, Philadelphia, H. W. Scattergood, proprietor, are reported to be quite busy. Three trimming machines are in active operation, turning out both charcoal and coke bright tin plates and American roofing plates, for which a good demand has been met with. It is the intention of the proprietor to add more trimming pots as the exigencies of business demand. The brands of terne plates produced at the Black Diamond Works are Laurel, Arrow, Quaker City, Horse Shoe, and Black Diamond. The two last named are stamped, and the Black Diamond is referred to as an extra coated roofing plate of very superior quality. The bright plates produced bear the same brand names as the ternes. All are made of American rolled black sheets. The agents in New York City for the Black Diamond Works are Temple & Lockwood, 12 Platt street.

GEO. H. ISMON, sales agent for the Falcon Iron & Nail Company, Niles, Ohio, and the Salem Wire Nail Company, Salem, Ohio, has removed his office from Room 28, 277 Broadway, New York, to more commodious quarters in Room 32, on the second floor of the same building.

SANDERSON & PECKHAM is the style of a new firm located at 76 Woodbridge street West, Detroit, Mich., who are rapidly coming to the front. They are styled manufacturers' agents, and sell to consumers and dealers a complete line of bright and terne plates, metals, tinners' and roofers' supplies, together with a few leading hardware specialties. Mr. Peckham is son of S. T. Peckham, late of the firm of J. S. & N. Peckham, Utica, N. Y. Mr. Sanderson was connected with the Black Hardware Company.

THE RETAIL STORE.

The Cream City Flour Bin and Sifter.

An illustration is herewith presented of the Cream City flour bin and sifter, made by the well-known manufacturers of tinware, the Geuder & Paeschke Mfg. Company of Milwaukee, Wis. The outer

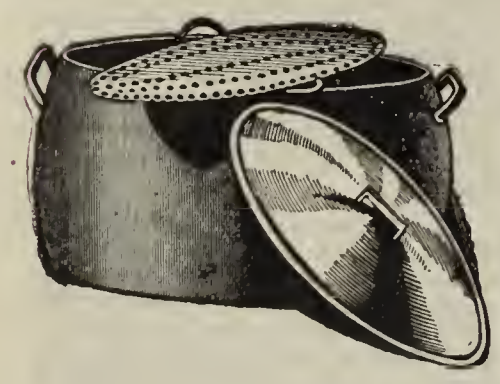


The Cream City Flour Bin and Sifter.

wall of the bin is broken away in the cut, so as to afford a view of the working parts of this admirable device for the convenience of the housewife. The manner in which it operates, as shown here, is so simple that no extended explanation is necessary.

Golden Crown Asparagus and Corn Cooker.

The cooker illustrated herewith is being offered by the Stuart & Peterson



Golden Crown Asparagus and Corn Cooker.

Company, Burlington, N. J. The cooker is an addition to their line of Golden Crown ware, and is provided with side handles. The strainer is removable and is designed for taking the vegetables from the pot. The point is made that the strainer is especially adapted to asparagus, as it keeps the bunches in order, which adds to their appearance on the table. It may also be used for meats and other purposes. The cooker is made in three sizes: Nos. 1, 2 and 3.

Squegee and Scrubber.

The Cleveland Novelty Company, Cleveland, Ohio, are offering the squegee and scrubber, of which illustrations are here shown. The Perfection squegee, Fig. 1, has interchangeable parts, with malleable shank and decorated steel side strips. It is remarked that the rubbers are made of the best Para rubber, ¼ inch thick; that when worn out new rubbers can be easily inserted, and that the device is thoroughly high grade. The Combination scrubber, Fig. 2, is a squegee and scrubber combined, composed, it is stated, of a Para rubber scraper, $\frac{3}{16}$ inch thick, and rice root brush of the best quality. It is adapted to the use of grocers, butchers and stores of all kinds.

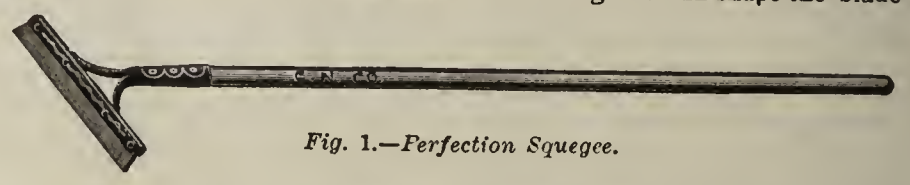


Fig. 1.—Perfection Squegee.

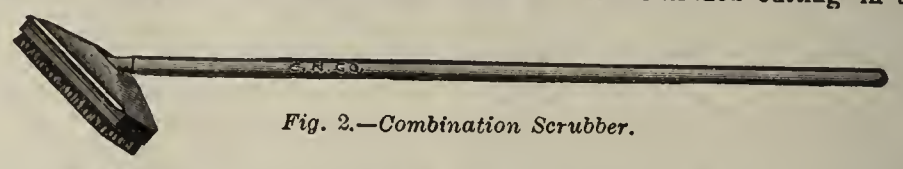
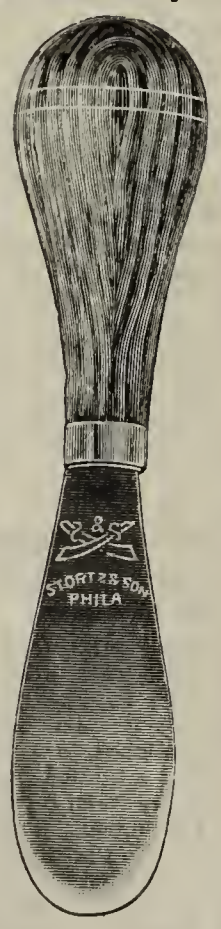


Fig. 2.—Combination Scrubber.

The Philadelphia Ice Chisel.

The cut herewith represents an ice chisel being introduced by John Stortz



The Philadelphia Ice Chisel.

& Son, Philadelphia. The blade is 5½ inches long and 1⅛ inches wide at the broadest part. It is described as being forged from a superior quality of too steel, carefully tempered and finished. The handle is of hardwood, nicely polished, and the tang of the blade is riveted through it. In shape the blade is similar to that of an iceman's axe, and is designed to crack ice in a straight direction without splintering. It is claimed that continued cutting in the same place will split the ice without splintering or chipping.

Central Draft Street Lamps.

The Rochester Lamp Company, 42 Park place, New York, well-known makers of the Rochester lamps and



Central Draft Street Lamps.

burners, have brought out a central draft street lamp, a general view of which is shown in the accompanying illustration. The advantages of the central draft lamp are being widely recognized, and its adaptation to street illumination will be of interest to the

trade. Special reference is made to the great amount of light the lamp gives. It is unaffected by wind storms, as the air entering the lamp passes through wire gauze and then down through the side tubes, one of which supplies the central draft through a gauze chamber and the other tube supplying the outside of the flame through another gauze chamber. The air currents are so modified by this means that the lamp has been successfully used on ferry boats. The globe is held up by a hook while trimming or lighting. The regular No. 3 or 9 street lamp globe is used with it, and is so annealed and protected from heat by the use of a chimney on the lamp inside that it is proof against storm, rain, snow, sleet or hail. It is adapted to burn all night or the time of burning can be regulated. It is made with either bail or post socket, and with 26-inch enamel reflector, if wanted for railroad or other uses. For general purposes of railroad stations, hotels and stable lamps, we understand it is meeting with a large demand.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE KEWANEE BOILER COMPANY of Kewanee, Ill., and 96 Lake street, Chicago, are building a boiler plant for use on the Chicago drainage canal. The plant will consist of three boilers 60 inches by 16 feet, fronts, castings, trimmings, breeching and smoke stack. This company report business as improving.

CLARKSON, SCOTT & Co., Drexel Building, Fifth and Chestnut streets, Philadelphia, Pa., have the contract for a steam heating plant for the Lorain apartment house, at Broad and Fairmount avenue. George F. Huber & Bro., 738 North Thirteenth street, have the contract for the plumbing work.

THOMAS WEATHERED'S SONS, 244 Canal street, New York, will use one of their No. 6 hot water heaters for heating the residence of E. T. Bedford, at 121 Clinton avenue, Brooklyn, N. Y.

ALBERT CRYER & Co., 85 Centre street, New York, will install a heating plant in the new parochial school at Seventy-sixth street and Lexington avenue, using the largest size Richmond Sectional boiler and 3300 feet of Bundy Columbian radiation. They are installing a Victor hot water plant in the residence of J. Montgomery, Seventy-fourth street and Riverside drive. They have recently completed the installation of a Victor brick set steam heater in the Kill von Kull Club of Staten Island, N. Y.

RUBEL & Co, 75 and 77 Lake street, Chicago, are to install hot water heating plants in the residences of A. Florsheim and C. Cline, located on Vincennes avenue, near Forty-third street.

THE BUILDING COMMITTEE of the Board of Education of Saratoga Springs, N. Y., have been instructed to receive plans and bids for various systems of heating and ventilating an annex to their High School building.

THE BUILDING committee of the Odd Fellows' Temple recently held a special meeting at 110 State street, Albany, N. Y., to pass upon bids for plumbing and painting and to confirm other contracts. The plumbing work upon the building will be executed by Ridgway & Russ.

THE EXETER MACHINE WORKS, Boston, Mass., have received an order for Exeter radiators to be shipped to Copenhagen, Denmark. We understand that the export business of this concern is rapidly increasing.

THE BOARD OF ALDERMEN of Buffalo, N. Y., have passed a resolution adopting the blower system of heating and ventilation for the new school house to be erected on Gurnsey street, for which plans are being prepared.

THE DUDLEY HOTEL, at Salamanca, N. Y., is to be rebuilt and enlarged, and among the improvements will be a steam heating plant and a plumbing system.

HART & CROUSE, 211 Water street, New York City, report, through their manager, W. M. Mackay, the following recent sales of Royal steam and water heaters: Wood Bros., Fishkill, N. Y.; F. Samuelson, Arlington, N. J.; Henry Dickson, Newark, N. J.; W. H. Clark, Lebanon, Pa.; Daniel McGurl, Pottsville, Pa., two heaters; German Methodist Parsonage, Dutch Kills, Long Island City, L. I.; Bogle & Scott, corner Hudson and North Moore streets, New York City; Virginia Plumbing & Heating Company, Roanoke, Va.: Dr. W. B. Johnson, Paterson, N. J.; A. L. Thrall, Jamestown, N. Y.; Paul Gantert, Palisade Park, N. J.; Geo. Devilin, Ravenswood, Long Island City, L. I.; Rudolph Guggenheimer, 101st street and Madison avenue, New York City, two heaters; J. Montgomery, West Seventy-fourth street, New York City. They report business on the increase.

LEE BROTHERS were awarded the contract for the plumbing in the fire engine house at Glens Falls, N. Y.

BIDS will be received by the Board of Education of Detroit, Mich., up to May 22 for heating and ventilating an addition to the Van Dyke School by means of hot air furnaces.

A. A. SANBORN has been awarded a contract for heating and ventilating the new High School building at Somerville, Mass.

THE UNION FURNACE COMPANY, 65 Dearborn avenue, Chicago, are to install a steam heating plant in the 24 flat building of T. E. Dorne & Co., Sixty-second street and I. C. R. R. tracks. Also in the residence of R. M. Wells, 3804 Michigan avenue.

THE CONTRACT for heating the north side of the Disston School, Thirty-fifth Section, at Philadelphia, has been awarded to Davis & Gorman Company for $1362.

THE SUPERVISING ARCHITECT of the Treasury Department has awarded Crook, Horner & Co. the contract for furnishing and erecting the plumbing apparatus for the Post Office building at Vicksburg, Miss.

PROPOSALS will be received by the Board of Education of Cleveland, Ohio, up to June 5, for a new school house which will require a system of heating and ventilation, will be lighted by gas and have a plumbing system.

SHEAHAN & GROARK, New Haven, Conn., the steam fitters and plumbers, are fitting up the house of Judge Samuel Bronson, on Dwight street.

THE CONTRACT for the heating apparatus for the new hospital at Easton, Pa., has been awarded to the H. B. Smith Company of Philadelphia, who will put in a hot water plant.

THE CONTRACT for the heating apparatus for the new gymnasium at Springfield, Mass., has been awarded to the Phillips Mfg. Company, whose bid was $956.

BABB, WITHAM & KELLEY, plumbers, Bangor, Maine, are doing a brisk business this spring. They have just put a very complete system of steam piping into St. Mary's Parochial School.

THE SMITH & ANTHONY STOVE COMPANY, 217 Lake street, Chicago, are to place their new Hub steel plate furnaces in six residences and two flat buildings at Ravenswood, and in four residences at Oak Park.

H. A. R. DIETRICH, Bethlehem, Pa., has received the contract for placing a steam heating plant in the extensive addition to the residence of R. P. Linderman on Fountain Hill.

AT A RECENT MEETING of the School Board Building Committee of St. Louis, Mo., John Kelley, assistant superintendent of repairs, presented recommendations for appropriations of $8904.89 for repairs and $23,311 for putting steam heat in the school buildings instead of stoves and furnaces.

Southern Pig Iron Freights.—The Queen & Crescent Route has issued a new east bound pig iron tariff, effective May 15, giving rates on pig iron in carload lots from Southern furnaces to the following plants:

To	From Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Rising Fawn, Ga., and Fort Payne, Ala.	Birmingham district.
Wilmington, Del ..	$3.70	$3.70	$3.95	$4.20
a Baltimore, Md. (rail and water).....	3.54	...	3.50	3.50
Baltimore (all rail)..	3.50	3.50	3.75	4.00
Washington, D. C...	3.51	3.51	3.76	3.76
a Boston (rail and water).	3.89	.....	3.85	3.85
Boston (rail and water) via Providence	4.54	.....	4.50	4.50
Elizabethport, N. J..	4.10	4.10	4.35	4.60
**a* Jersey City (rail and water).....	3.54	.. ..	3.50	3.50
Jersey City (all rail).	4.10	4.10	4.35	4.60
Lockport, N. Y... ..	3.30	3.30	3.55	3.80
†*a* New York (rail and water).	3.54	.....	3.50	3.50
Allentown, Pa.....	3.70	3.70	3.95	4.20
Chester, Pa.....	3 90	3.90	4.15	4.40
Harrisburg, Pa . ..	3.56	.....	3.81	3.81
Lancaster, Pa.....	.. ...	. ....	.....	.....
a Philadelphia (rail and water).....	3.54	.....	3.50	3.50
Philadelphia (all rail)	3.70	3.70	3.95	4.20
Pottsville, Pa..... ..	3.70	3.70	3.95	4.20
Reading, Pa.....	4.27	.....	4.52	4.52
Scranton, Pa.....	3.70	3.70	3 95	4.20
a Providence, R. I. (rail and water)...	3.89	.. ...	3.85	3.85

a Via Norfolk.
* In addition to above charges the cost is as follows: In lots of 50 tons and less, 60 cents per ton; over 50 tons, 50 cents per ton.
† The above rates cover pier delivery only. Additional charge within lighterage limits is as follows: In lots of 50 tons and less, 60 cents per ton; over 50 tons, 50 cents per ton.

A gushing oil well was struck on the 11th inst. in the new oil field near Neodesha, Kan. The well is 850 feet deep. For some time after the vein was tapped the oil was thrown above the top of a 74-foot derrick.

On her eastward voyage last week the swift Cunarder "Lucania" broke the record for a single day's run by covering 524 knots, on May 9.

Brooklyn gas companies have reduced their rates to $1 per 1000 feet.

ROOFING AND CORNICE.

John Galt & Sons.

John Galt & Sons, who have been at 52 John street, New York, for about 20 years, have established themselves in new and very desirable quarters in the Postal Telegraph Building, at Broadway and Murray street, rooms 805–806. This concern are said to be pioneers in the business of quarrying slate for roofing and other purposes and delivering it at a railroad station. This industry they commenced in 1861 and ever since their sales for domestic trade, we are told, have averaged 125,000 squares a year. From 1864 to 1875, inclusive, they claim to have supplied two-thirds of all the slates produced in this country. In 1876, owing to peculiar conditions abroad, they commenced exporting to Europe, largely to Great Britain, which is itself a large slate producing country, sending on an average 200,000 squares each year until 1879-80, when the bulk of the trade in that market lapsed. Up to 1893 they have done quite a large business with Australia, and more or less to date with the West Indies and South American countries. Slates in America are sold by squares, a square being equivalent to a space 10 feet square or 100 square feet. In England they are sold by the thousand pieces, but the buyer really gets 1200, while Welsh slates are furnished on the same basis with 5 per cent. in quantity added for breakage, or 1260 for 1000. The latter custom evidently has grown from the fact that slates quarried in Wales are thinner, with a consequent larger loss in handling.

Friedley & Voshart,

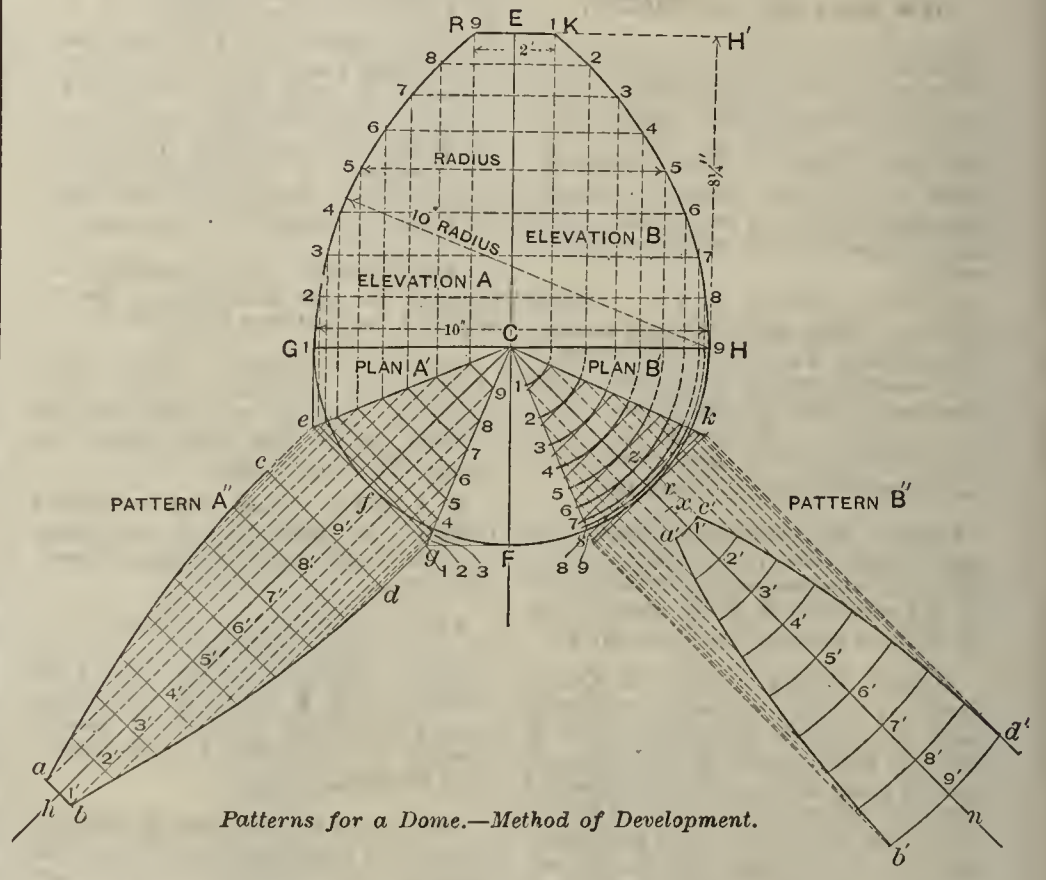
194 and 196 Mather street, Chicago, have just issued a new catalogue of architectural sheet metal ornaments, statuary, &c. This catalogue is their fifth annual, and is said to be the largest in its line which has thus far been published in this country. It comprises 136 broad pages replete with illustrations and price-lists. Many of the designs shown are entirely new, and are exclusively brought out by this firm. The first half dozen pages are used for the display of designs for statuary. These are made from models by some of the best artists and sculptors in the country. Next follow mediæval and modern forms of gargoyles and eaves trimmings, heads of animals, human heads and medallions, followed by festoons, garlands and wreaths in very great variety, rock faces in numerous patterns, panels, scrolls and square, oblong and circular rosettes, ceiling center pieces, finials or pinnacle tops, twisted tops, column trimmings and urns, shells, friezes, moldings and ornamental designs for enriching all kinds of finishing work, crestings, dormer window embellishments, gable ornaments, panel ornaments, capitals, leaves, mansard roofs, ceilings, points, crockets and volutes, conductor heads, spun balusters, merchants' emblematical signs, &c. The firm greatly enlarged their factory the past year so as to be able to meet orders for special or stock goods with the least possible delay.

Patterns for a Dome.

From J. C. A., *Green Bay, Wis.*—I would like to see a method, or methods, published in *The Metal Worker* by which I can obtain the patterns for a dome shaped article of eight pieces, and either octagon or round in plan. As shown in the accompanying sketch, the base of article G H is 10 inches, and the top R K 2 inches in diameter. The vertical hight H′ H is 8¼ inches. The profiles G R and K H have a radius of 10 inches, and are struck from points G and H as centers.

Answer.—In the accompanying diagram let G R K H be the elevation of dome, to be constructed of eight pieces, as indicated in plan by G *e g s k* H. In elevation A and plan A′ the pattern is obtained for an article having eight flat sides and octagon in plan, while in elevation B and plan B′ the pattern is obtained for an article of eight pieces, but round in plan, the pieces to be formed to the required shape by raising. To obtain the pattern A″ from elevation A and plan A′ proceed as follows: Draw the elevation in such a manner that one of the sides, as G R, will be shown in profile; also draw the corresponding plan in line, as shown by G *e g* F. Divide the profile G R into any convenient number of equal parts, as indicated by the small figures, and from the points thus obtained drop lines parallel with the center line E F, cutting the miter line C *e*, as shown by the dotted lines. From the points thus obtained in C *e* carry lines parallel with *e g* of plan, cutting C *g*. On C *f* extended, as *f h*, lay off a stretchout of R G, as shown by *f h*, through the points in which draw the usual measuring lines. Place the T-square parallel to the stretchout *f h*, and bringing it against the several points in the miter lines C *e* and C *g*, cut the corresponding measuring lines drawn through the stretchout line *f h*. Lines traced through the points thus obtained, as indicated by *a c d b*, will form the desired pattern.

Using the elevation B and the plan B′, the pattern B″ is obtained as follows: From the points obtained in G R carry lines parallel with G H, cutting K H, and from the points thus obtained drop lines parallel with E C, cutting C H, as shown. With C as center, and the points in C H as radii, strike arcs cutting C *k* and C *s*. From the points of intersection in C *r* erect perpendiculars cutting C *s* and C *k*. On C *r* extended, as *r n*, lay off a stretchout of K H, as shown. With radii equal to distance across elevations A and B, as indicated by the dotted lines drawn from points in G R to K H, strike arcs through the points in stretchout line *r n*. Thus the arc *b′ d′* of pattern is struck with G H as radius, from point *x* as center. Arc *a′ c′* of pattern is struck with R K as radius, from point *z* as center. Place the T-square parallel with the stretchout line *r n*, and, bring-



Patterns for a Dome.—Method of Development.

ing it successively against the points of intersection of the perpendiculars with miter lines C *s* and C *k*, cut corresponding measuring lines drawn through the stretchout line *r k*. Lines traced through these points of intersection, as shown by *a' c' d' b'*, will form the required pattern.

FLASHINGS.

ÆTNA STANDARD IRON & STEEL COMPANY, Bridgeport, Ohio, issue a very neat roofing catalogue. The volume, of the usual dimensions, is bound in dark colored paper with gilt title, and contains much information that is of interest to the roofing trade. The company make black, painted and galvanized roofing sheets, plain, corrugated and in other forms; also common, cold rolled, pickled and plain finished sheets and plates and common and patent leveled sheets. The catalogue opens with a view of the extensive works of the firm at Bridgeport. Following a prefatory note are tables of weights. The illustrated portion of the catalogue relates to corrugated sheets, crimped iron roofing and siding, beaded siding and ceiling, weather boarding, siding, &c. At the close of the pamphlet are a number of blank pages for memoranda. We learn from the Ætna-Standard Company that trade is at present active under the stimulus of short supplies, brought about by the curtailed production resulting from the coal and coke strike. The firm have part of their works in operation on natural gas, but a portion is closed down on account of a lack of fuel. They have, however, abundant stocks of galvanized iron and black sheets, also corrugated, from which they will be able to meet all ordinary demands from customers during the present season.

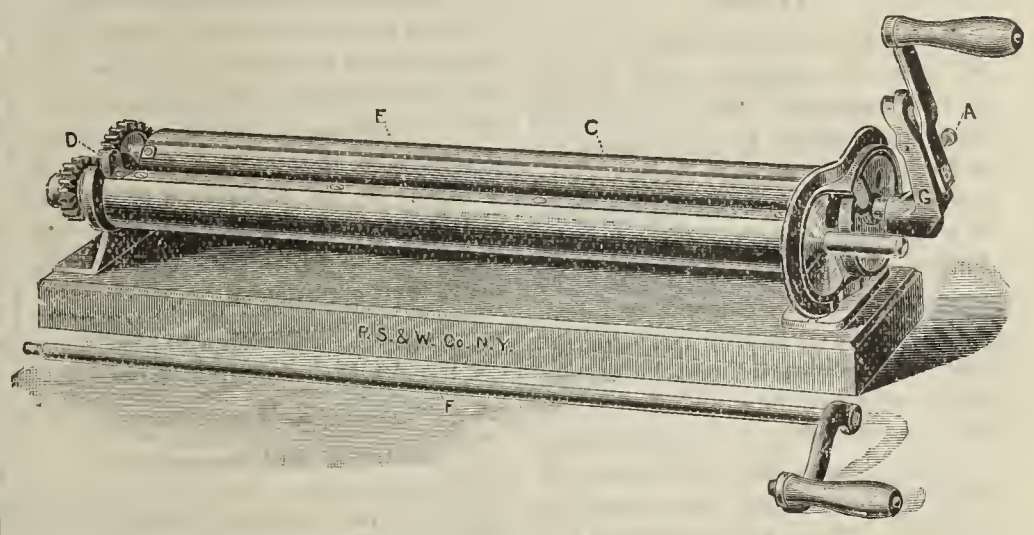
THE SALTSBURG ROLLING MILL COMPANY have been organized and are now at work on the erection of a plant at Saltsburg, Pa., on the line of the Baltimore & Ohio Railroad, some 8 miles from Pittsburgh, for the manufacture of fine sheet iron, sheet steel and rustless roofing sheets. The plant consists of three sheet mills and one sheet bar mill. The engine, bar mill and two of the sheet mills are being built by the Robinson-Rea Mfg. Company of Pittsburgh, builders of rolling mill machinery. The boilers are being furnished by the Carroll-Porter Boiler & Tank Company of Pittsburgh. The buildings will consist of a main building, 80 feet wide by 240 feet long, with shedding 30 feet wide and the same length, and boiler house, 32 x 60 feet. The buildings are of frame, with iron roof, and are about completed. The firm expect to be in the market with the above lines of manufacture about October next. The officials of the concern are S. A. Gourley, president; W. F. Stitt, treasurer, and Gill Sitt, secretary.

KNORR & BLOCKS 165 Wells street, Chicago, have contracts for furnishing the galvanized iron cornices, gutters, slate roofs, &c., for the store and flat buildings of C. J. Langan and Euhl & Smith, Lincoln and Southport avenues. Also for the residence of H. Zimmermann, Berdo and Perry avenues, Ravenswood.

ROBERT HOWARTH'S SONS of Chester, Pa., are putting a slag roof on the Chester Lumber & Coal Company's new shed at Chester. The area of the roof is 40,000 square feet, and over 100 tons of material will be used.

Eaves Trough and Conductor Pipe Former.

The Peck, Stow & Wilcox Company, Southington, Conn., and New York, are bringing out a novel and ingenious machine, as shown in Figs. 1 and 2, for forming both eaves trough gutter and conductor pipe. It is intended to take the place of the following regular machines heretofore used for this purpose —viz : Gutter former, gutter beader, pipe former and folder. As shown in Fig. 1, the machine is arranged for turning a lock on and forming conductor pipe. Such pipe can be formed on this machine of any diameter from 2 to 4 inches, and when run through the machine in accordance with minute directions given with each the pipe is formed and a fold turned on the edge ready for grooving. Fig. 2 illustrates the machine as arranged for beading and forming eaves gutters. The machine described is 30 inches long, but can be made of any desired length within reasonable limits. The eaves gutters can be formed of any size, but the bead on the edge is made of only one size. This size, however, can be made to suit the requirements of the purchaser.



Eaves Trough and Conductor Pipe Former.—Fig. 1.—Arranged for Turning a Lock on and Forming Conductor Pipe.

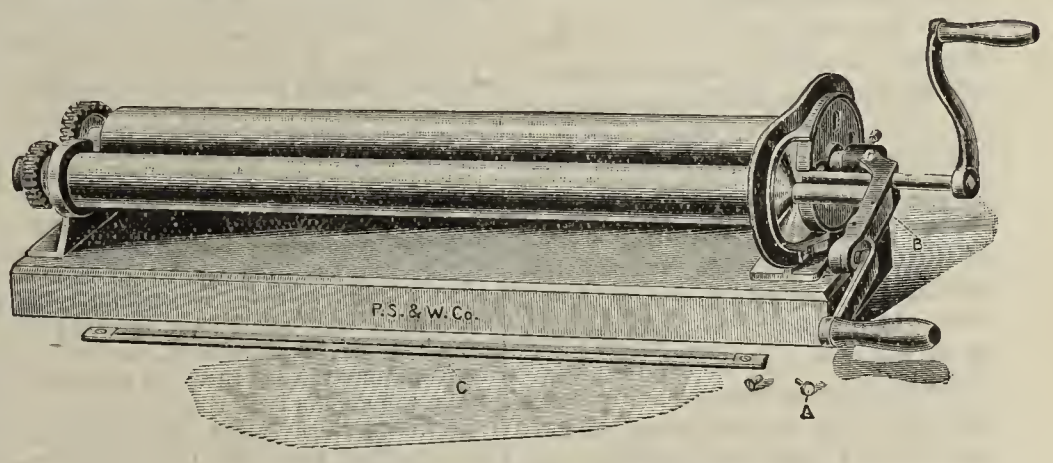


Fig. 2.—As Used for Beading and Forming Eaves Gutters.

Coin in the slot gas meters are to be tried in San Francisco. An English gas journal states that 75 of such meters have been shipped to that city from Glasgow, Scotland. They are adjusted to deliver 125 feet of gas for every 25-cent piece dropped in the slot

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Coppersmiths in England have adopted a line of work that is meeting with great success. They are reproducing all the old fashioned shapes in jugs and vases in burnished copper. The old leather bottle shapes look very inviting in metal, and can be copied with surprising accuracy.

The insatiate maw of the Standard Oil Trust has just made another gobble. Under its Western name of the Continental Oil Company, it has absorbed the Vacuum Oil Company of Denver, Col., who control the sale of two-thirds of the lubricating oil consumed in the West.

A decision of importance was handed down last week by Justice Brewer of the United States Supreme Court, denying the right of certain Southern and Western States to levy the interstate commerce tax imposed on commercial travelers. A Chicago salesman recently visited Titusville, Pa., and, not having taken out a license, was fined $25. The judgment was affirmed, on appeal, by the Supreme Court of Pennsylvania. Justice Brewer in reversing this judgment said: "No State can levy a tax on interstate commerce in any form, whether by way of duties laid on the transportation of the subjects of that commerce or on the receipts derived from that transportation, or on the occupation or business of carrying it on." This decision will set at rest a long disputed question, and will be hailed with approval by the traveling fraternity.

Railroads in the West and Southwest are beginning to report increased earnings. This is regarded as a promising sign of recovery in those sections of the country where the late depression was most pronounced.

STOVE TRADE NOTES.

The New England Stove Trade.

The condition of things in this territory has not undergone much change since last reported. There is possibly a slight improvement in the demand for ranges, but it is scarcely enough to be worth noting. Notwithstanding this, the trade seems to be in a cheerful frame of mind; manufacturers having reduced production to fit the demand, and dealers having placed their orders with reference to the depressed state of things. Many more stoves might be sold if the dealers were willing to extend credit, but with the average workingman on short time and reduced pay, owing his grocer and butcher and not gaining any on his indebtedness, dealers generally are refusing to sell to this class except for spot cash. Orders for single stoves are numerous, and generally accompanied by the request that shipment be made at once, as the stove is already sold. Manufacturers in this vicinity are for the most part running on full time, particularly those in the Taunton district. Stocks of both jobbers and retailers are very low, and any revival in business will be felt almost immediately by the manufacturers, and some of them are discounting this by making up considerable stock. Medium and high price goods seem to be the best sellers at present, possibly the latter taking the lead. Collections are satisfactory.

An interesting feature of the New England stove trade is the business of two foundries, one in Massachusetts and the other in Maine, which sell their product entirely through peddlers. This system has been in vogue for some years and is carried on successfully. Carloads of stoves are shipped to various points and there met by two men with a team upon which is loaded as large a variety as the wagon will carry and then taken about the country from house to house and sold to the poorer class of farmers and laborers living in out of the way places, although occasionally these people invade the larger towns and temporarily create consternation among the regular dealers. The Yankee genius for bargaining finds great scope in this line, old stoves being frequently taken in trade and sometimes articles of farm produce, although for the most part the goods are sold outright and a long time note without interest accepted in payment. It is a common thing for these notes to run one year.

The furnace trade is halting. Local dealers have a good many estimates out, but as the building season is not fairly open few contracts have been awarded, consequently a hand to mouth business is being done in this line at present, but the prospects for the summer season are fairly encouraging. Gasoline stoves appear to be booming, and the sale of gas stoves is on the increase owing, it is thought, to the prevalence of $1 gas. Refrigerators are moving rather slowly, but some duplicate orders have already made their appearance.

Cupola Management.*—XII.

BY DR. EDWARD KIRK.

Relining and Repairing.

When a cupola is newly lined the lining is generally made of the same thickness from the bottom to the top except when the cupola is boshed. The casing is then either contracted to form the bosh or it is formed by putting in two or more courses of brick at this point. The lining varies in thickness from 4½ to 12 inches, according to the size of the cupola, the heavier linings always being put in large cupolas. The greatest wear on the lining is at the melting zone, where it burns away very rapidly. From this point up it burns away more gradually and evenly, but the greatest wear is toward the bottom, where the heat is the greatest, and so a cupola gradually assumes a funnel shape with the largest end down and terminating at the melting zone, and the lining is always thinnest at about this point when it has been in use for some time.

At and below the tuyeres the destruction of the lining by heat is very slight, and the principal wear is from chipping and jarring in making up the cupola. At the charging door the principal wear is from the stock striking the lining in charging. In the stack the lining becomes coated with sulphides and oxides and is but little affected by the heat. A stack lined with good material properly put in generally lasts the lifetime of the cupola. The length of time a cupola lining will last depends upon the amount of iron melted and the way in which it is taken care of, and varies from six months to three or four years when the cupola is in constant use.

A lining burns away very rapidly at the melting zone, and if not repaired every heat would burn out to the casing in a few heats. Above the melting zone it burns away more slowly and evenly, and gets thinnest just above the melting point. From this point it gradually grows thicker up toward the charging door, where the wear is comparatively slight. The thickness of lining required to protect the casing where the heat is most intense depends upon the quality of the fire brick and how the lining is put in. A lining of good circular brick made to fit the casing, and laid up with a good, well mixed grout, remains perfectly solid in the cupola as long as it lasts, and may be burned down to 1½ inches in thickness, and even less, for several feet above the melting point. When the brick do not fit the casing and large cracks or holes have to be filled in with grout, and daubing or the lining is poorly laid up, it becomes shaky as it burns out and in danger of falling out, and it cannot be burned down so thin as when solid.

It is therefore cheaper in the long run to get brick to fit the casing and have the lining well put in. It will then only be necessary to reline when the lining gets very thin almost up to the charging door. The lining at the melting zone, where it burns away the fastest, is often taken out for 2 or 3 feet above the tuyeres and replaced with a new one when it is not necessary to reline all the way up. In repairing a lining in this way the same size brick are generally used as were used in lining. The lining has been burned or worn away above and below the point repaired and the new lining reduces the diameter of the cupola to the smallest at the very part where it should be the largest. The result is that the new lining is cut away faster than any other part, and after a few heats it is as bad as it was before the new section was put in.

A better way of repairing a lining at the melting zone is to put in a false lining over the old lining. This is done by putting on a layer of rather thin plastic daubing over the old lining and pressing a split fire brick into the daubing with the flat side against the lining. The brick are pressed into the daubing close together almost as soon as it is put on and all the joints are filled up and the surface made smooth. A lining may be put in a cupola in this manner all the way around and to any hight desired, or only thin places may be repaired, which is done without forming humps in the lining that interfere with the melting.

A split brick is an ordinary fire brick, only 1 inch thick in place of 2 inches, and is now made by all the leading fire brick manufacturers. I believe I was the first to repair a lining in this way, some 20 years ago. The split brick could not then be procured from the fire brick manufacturers, and they were made by splitting the regular sized brick with a sharp chisel after carefully nicking them all around. When the regular split brick cannot be procured they may be made in this way. Most of the new brick split very readily and true, but bats from old lining generally spall off and are difficult to split. A lining of split brick can be put in almost as rapidly as the cupola can be shaped with daubing alone. The diameter of the cupola is not reduced to the same extent as with a section of new lining put in in the regular way, and the best melting shape for the cupola is maintained with only a reduction in the diameter of from 3 to 4 inches. This lining, when put in with a good daubing well mixed, lasts as long as an equal thickness of lining put in in the regular way; and it can be put in at a great deal less expense for labor and material. It is, however, worthless if put in with a poor, non adhesive and unrefractory daubing.

*Copyrighted, 1894, by Edward Kirk

The bats from old linings make an excellent daubing or grouting material when ground fine and mixed with a little clay, but few foundries have a sufficent quantity to pay for constructing a mill to grind them in, and the only other use that can be made of them in the cupola is to split the best into spalls for pressing into a thick daubing when repairing a lining.

[THE END]

Cleaning Castings.*

BY A. C. MOTT.

Before beginning this subject I wish to say that there is no probability of my saying anything new, or anything that is not already known to most, if not all, of you; and that if this article causes any discussion that will bring out the best and cheapest method of cleaning castings, its object, I take it, will be accomplished.

Into this subject, like all others pertaining to cleanliness, personality enters to the greatest extent. Some persons are noticeably clean; others the reverse. Some persons have everything clean about them; others the reverse; and with the cleaning of castings as much depends upon the personal disposition as in any other point in our business.

There are foundries in existence which have nothing but the old fashioned scratch brush, and yet turn out better cleaned castings than those having the most modern machinery. Your castings can be made as clean as you demand they shall be, just as your castings are made of such a standard as you demand and your inspector enforces. The inspector is, after all, the one person who controls, and it is upon his judgment that you must depend as to whether your castings are properly cleaned or otherwise.

I might say that the first point, or place, in which you start to clean castings is on the molder's floor; if you use such care in the selection of iron, sand and facing that the sand will not burn to the casting, but will scale easily from it, in fact so that a goodly portion of the sand is rapped off by the molder, you have accomplished just so much in the cleaning.

Early Methods of Cleaning Castings.

The old fashioned method was to use a wire scratch brush, made of No. 16 to No. 28 wire done up in a mass, with which a man brushed the sand from the casting.

Then mills came into use, which were made hexagonal or round form, either of iron or wood, and each mill driven by its own belt from shafting suitably placed. The castings were packed immovably in these mills with small shot iron placed between them, and the movement of these shot when the mill was revolved rubbed the sand from the casting.

Since then they have experimented with square mills and some claim for them great advantage, as they are much easier packed, and more work and larger castings can be placed in them, and with much less liability of breakage and with generally better results in cleaning.

Of late years, however, they have introduced great improvements in this respect, in the form of sheet steel mills running on hollow spindles. The outer cases of these mills are perforated, not to allow sand to escape, but to allow air to enter, which is drawn in by a suction fan so placed as to suck the air through the openings in the outer shell, which carries the dust and sand through the spindle, and forces it through proper tubing and deposits it at any given point desired.

In these mills they use small star shot made of exceedingly hard iron, which are known by the name of "steel shot." These have five or more points with sharp edges, which enter into all deep carving and interstices, when the mill is not too closely packed, and the dust is drawn away by the fan, and the castings come out exceedingly clean, and if run for any length of time the rubbing of the shot brings the graphitic carbon in the iron to the surface, thereby making a very high polish which, when touched with the hand comes off with all the effect of black lead.

These mills are so made that they can be run in couples back to back from one shafting, and are started or stopped by a friction clutch, and in some cases they are so arranged that as high as four couples or eight mills are run in the same form. The only drawback I have ever heard in regard to these mills is the trouble experienced by the sand getting into and cutting the bearings of the machinery, thus causing considerable expense for repairs.

Churns.

There is also a class of mills known as churns which do most excellent work. They are cheap, and, in the writer's opinion, exceedingly profitable. These mills should be placed over a pit or cellar, walled in so as to retain the dust and dirt. Preferably these should be made large enough to contain a week's supply of sand, with openings at bottom for the purpose of removing the same. A driving shaft is made long enough to carry ten or less of these churns. On these are placed flanged wheels about 8 inches in diameter, made with chilled face. A loose shafting extends over the length of one mill, which is made, say, 30 inches long and from 10 to 24 inches in diameter, and bearing wheels placed to match those of the driving shaft, the top of both sets of wheels running level with the floor. The mill is made so that the heads of the mill rest upon the wheels and is driven by friction. The mill is rolled off these bearings on to the floor, opened and packed. When I say packed, I mean the castings are put in loosely. The shot used are star shot, and are never removed. The mill is closed up, rolled on to the friction rolls, started and allowed to run for one, two or three hours, or such time as is necessary to clean the work. The expense of running is very small, consisting principally of the lining up of the shaft once a year, while the mill itself will wear from two to five years, and the repair work outside of the shafting cuts a very small figure.

These are largely in use in our part of the country in malleable iron shops, hardware shops, &c., and are considered very desirable.

The Acid Bath.

There has also recently been invented an acid, the castings being placed just as they come from the molder's floor in a bath of the same The acid attacks the sand rather than the iron, and it is claimed simply scales the castings without eating into the iron. For some characters of castings this would be highly desirable.

I do not think it is necessary in this article to describe or consider the sand blast methods of cleaning, as they have been tried and found wanting, and I do not know of any one who has tried this system who has it in use at the present time.

This covers what is generally known as the cleaning of castings, and I believe covers all I was requested to speak of in this respect, but I consider that the cleaning of castings extends much further than the mere brushing off of the foundry sand which adheres to it, as under the head of the cleaning of castings comes the counting and inspection of the work.

Counting and Inspection of Work.

There are some shops who count the work in the gangway in front of the molder's floor, and who discount from the cleaning room after inspection. This method has its advocates.

Another method is to count the work after it is cleaned—that is to say, the work is carefully sorted, all the plates belonging to each stove being placed in separate piles, and an inspector or ware boss counts the parts and the molder receives credit from this count.

Still another way is not to count the work at all; simply clean it and put it on the work room shelves. When the stove is mounted, the molders making this stove are credited with the number of parts of their work required to mount the stove. To illustrate: The No. 8 Starlight cook stove is in the sand. It is divided among four molders, who make parts for a number of stoves. Molder A's parts amount to $0.96 for one part, molder B's $0.87, molder C's $0.91, molder D's $0.90. When the mounter takes the work from the shelves to mount say eight stoves, molder A is credited for 8 × $0.96, $7.68; molder B is credited for 8 × $0.87, $6.96; molder C, 8 × $0.91, $7.28; molder D, 8 × $0.90, $7.20. This seems to be a perfectly fair method, as it requires the molders to make their work even, as no work is counted unless it is even. Where odd work is required under this system, it is taken from the shelves, notification being given the foreman, who sees that the extra parts necessary to even it up are made, the molder being paid for such extra parts.

While this plan works very advantageously to the manufacturer and also to the molder, yet the feeling exists that he is not getting paid for what he does, especially when the end of the week comes and he has parts left on the shelf, owing to his partners on the job not having their parts even with him. Yet the experience of those who use this system shows that molders receive as good wages by this system as by any other; the disadvantages, if any, being to the manufacturer, caused by forcing work through to keep the stoves even.

The cleaning of castings cuts a very large figure in the general results of the manufacture. I would state that I have known parties making first-class stoves, as far as molding, mounting and trimmings were concerned, but they were careless in their cleaning, and I have heard dealers say: "Why, their stoves are of no account; they do not even brush the sand off their castings."

Castings for Nickel Plating.

After the castings have been cleaned in any of the manners aforesaid, there are many of them that require to be nickel plated. These are placed in mills of the exhaust character, and remilled with sharp, new star shot, and thus made absolutely and positively clean and ready for the polisher. This method, which, I think, is generally used, is probably the cheapest method possible. This would cover the cleaning of them for japanning as well.

There is also a water mill very largely in use, which is used to polish small castings, such as turn keys, shakers, lifters, &c. The mills are made either of the cylindrical form, with a man or hand hole through which to place the castings, and which is closed with gum gaskets in the same way as the man or hand hole of a steam boiler. Being water tight, water is placed in them before closing, together with sandstone spalls or small pieces of granite.

Others make these mills in an egg shape in two pieces united at the center, where they are not tight, and run them in a tub of water, the water entering the crevices in the center; and the castings being, by the shape of the mill, thrown outwardly and then inwardly, receive their polish in this way.

Both of these forms of mill are doing good work. The castings, to fit them for nickeling, should be allowed to remain in the mills and kept moving from two to six days, according to the character of the work.

Castings which require to be nickel plated also require buffing, and as grease is used on the buffing wheels it often deposits on the background of the castings, requiring them to be cleaned. Soft soap and hot water is probably the best method for cleaning these. We have tried many cleaning compounds, articles which are much more expensive, but find the above is preferable.

In conclusion, I would state that a sufficient quantity of mills—that is, enough so that the work can be kept in them long enough to become properly cleaned—is highly advisable, and it is of the utmost importance that work should not be removed until it is absolutely clean, thus saving the expense attending upon the handling and rehandling of the work, which would otherwise be necessary.

MORAL: Put up more mills than you want and good ones.

* Read at the convention of the National Association of Stove Manufacturers, held in Chicago May 2 and 3.

THE GEM CITY STOVE MFG. COMPANY of Quincy, Ill., are the assignees of a patent recently granted to F. Kaempen, Jr., and covering a device for operating oven shelves. The invention relates to stoves having oven shelves or pan supports which are moved in and out by means of a connection with the oven door. The object of the present device is to secure a simple, convenient, durable and economical means for moving the shelves or pan supports outward in a straight line as the oven door is opened and without danger of any binding of the parts. It is also intended to provide a means whereby the device when disconnected from the door, and the shelf withdrawn or slid outward, may be automatically set or shifted into correct position to connect with the door by the inward sliding movement of the shelf.

The Education and Production of Finished Workmen.*

BY H. D. KELLER.

Before entering on this subject let us consider of what the qualifications of an efficient workman consist.

A person, in order to be efficient at anything, must possess a practical knowledge of all details in connection therewith. While one possessed of such knowledge may be a capable workman, there are a number of things that may cause him to be undesirable. He may be quarrelsome or continually causing trouble, or may on account of carelessness be the cause of great loss to his employer, or he may be the possessor of that unquenchable thirst of which so many unfortunately are the victims. It is therefore plainly to be seen that the standard of desirability cannot be based on efficiency alone.

Now let us see whether or not our workmen are efficient. A look over the patterns of the range or heater that has been in the sand but a few months, or a glance over our broken and discounted castings, brings us to the natural conclusion that their standard of efficiency is low. As it is an undisputed fact that the standard of ability among workmen of the past was far superior to that of workmen of the present day, we naturally look for the cause of this depreciation of ability.

The "Whole Stove" Plan.

Some years ago molders worked on what is known as the "whole stove" plan; that is, one molder made a whole stove each day, or else two or more worked in conjunction, and in either case were only paid for complete stoves. Under such conditions the loss of a casting was something to be avoided; the natural tendency would cause a molder to be cautious. A poor workman under this system could not hold a job, much less work with a gang that had a set of patterns split up between them, and in consequence there was a scarcity of poor molders; there was also another advantage in this system, and that was a desire on the part of one molder or gang of molders to turn out superior work to that made by others, as the stoves on a whole would show up for or against them.

The larger foundries in later years discontinued the system because there was such a demand for certain stoves that molders in many cases would work on one pattern the greater part of the year. The natural result was a lot of bottom molders, top molders, oven door molders, flue strip molders, &c. Under this system the loss of a casting on the part of the molder was only its piece price value, and consequently the ability of the molder as a general workman fast depreciated. He naturally became more skilled in making the piece he was working on, and as a result did a larger day's work than he had formerly done under the whole stove system. This fact could not escape the ever watchful eye of their employers for any great length of time, and the result was a reduction of wages Now it is a fact where there is once a price made on a piece of work the workman either concludes that he is getting what it is worth to make, or that he is getting less—never more; when this price is reduced he concludes that he is getting less than the piece is worth, and in consequence puts less labor on it, which must result in inferior work. This has been the experience of foundrymen after strikes caused on account of a reduction in wages, and it has always taken a long time to again get the quality of work to the same point of excellence that it had before the reduction took place. And in many cases the same results have not been obtained even after a lapse of years. With workmen produced under the straight job system, is it to be wondered at that they cannot do what was accomplished in former years when the change that has taken place in the stove business in the last few years is taken into consideration? Competition has forced manufacturers to make such a large and ever changing variety of stoves that even the skilled molders of the past would find it difficult to come up to their former point of excellence. Patterns are not given the finish they received in former years, as the expense of doing so would soon eat up what little margin there is yet. This also helps to keep down the quality of work produced. Where stoves can be kept in the sand the year around there is very little cause for complaint on account of inefficient workmen, but as the demands of the trade are such that this cannot be done we need go no further looking for a remedy with our molders. We must look for a remedy in the production of molders of a superior class, and to do this we must start at the foundation—namely, the educating of our apprentices.

* Read at the convention of the National Association of Stove Manufacturers, held in Chicago May 2 and 3.

Educating the Apprentice.

Men and boys can be classified as follows: The know-nothing class, among which we find those that, although they may be young in years, have long ago outgrown their period of learning. They know it all. No matter how much thought and study you may have given the subject, they will surely try to convince you that they know more about it than you do. There is another class who are ever on the lookout for more information and knowledge. They find others engaged at the same occupation who, in their estimation, are superior workmen to themselves. It is this last class that possess the qualifications desirable in an efficient workman; and it is of this last named class only that we can produce capable workmen.

The first and most important step is to select only those that have the necessary qualifications to make them desirable. An active temperament, a desire to learn and a good, strong constitution are things that are most essential. There are, of course, numerous other features that are desirable; but we are not looking for angels among boys desiring to learn a trade. We will make mistakes at times in selecting boys, and when we find such to be the case it is well to drop them at once. Two weeks ought to determine, in most cases, whether or not a boy is desirable.

The Instructor.

Having selected desirable apprentices, our next step is to make thorough workmen of them, or rather lay a foundation with that object in view. To accomplish this we require a competent instructor, who, in addition to being a first-class workman, should also possess the faculty of knowing how to get the best results out of those he may have in charge; he must know how to study their various dispositions; he should know when a few words of praise can be bestowed to good advantage; he should know that the secret of success in teaching lies principally in knowing how to work on the learner's ambition, and as it is a well-known fact that "ambition likes praise, not flattery," it becomes evident that it must dislike the negative thereof, which is fault finding.

No matter how ambitious and willing the learner may be, or how good at learning, he will make mistakes, and in such cases it requires good tact on the part of the instructor to do the correcting in such a way that the ambition of the learner will not be cooled; it can be done in a very nice way by pointing out the excellent work done by some one else, and the natural result will be a desire to excel.

Instructors must not expect the learner to know as much in a few months as it took them years to acquire. Beginners must never be crowded, but instead must be taught how to make every move count. They must have a reason given them why work should be done in a certain way—in fact, a reason for everything. If this is not done they are liable to find some other way of doing it.

No mold should be closed that is not perfect. Don't ever let a boy understand that anything short of perfect work is good enough. No good results can be obtained any other way.

Teaching a system is of the utmost importance. System means the most work obtainable with the smallest amount of labor, and it further means neatness, a place for everything and everything in its place.

Object of Learning a Trade.

It must be remembered that there is but one object in learning a trade, and that is to earn money, and that all those learning have that object in view. It must, therefore, be demonstrated that the journeymen in the shop earning the most money are those who have the least loss and do the best work, and that there is only one way to accomplish this, and that is in learning the best way to make everything.

Where it could be done a great help would be an evening class for boys, where everything in connection with the production of stoves could be taught, as well as mechanical drawing, geometry and algebra; these last named branches tend to strengthen the reasoning faculties. Practical demonstrations in the shape of lectures would also be of great benefit. The thorough education of apprentices in the art of molding cannot be too strongly insisted upon. It is nearer an art than it is a trade, and the apprentices we turn out will ever carry our trade-mark in the shape of their abilities; and it is a certain fact that the class of work made in any shop can be judged by the class of molders turned out. Apprentices left to shift for themselves, as a rule, will only excel in one thing—that is, their ability to keep up a good supply of scrap.

In a small shop the foreman finds time to instruct, and in larger ones, where from 10 to 30 apprentices are employed, it pays to have a good instructor. We may see the money paid an instructor on the pay roll and feel that we may pay it out without getting adequate returns, but it is a wrong conclusion, as the labors of that instructor will show in the increase of the earnings of our apprentices, as well as in the quality of their work.

As a whole, a good instructor with capable apprentices and constant oversight and assistance by the employer will certainly produce efficient workmen.

Selling Stove Repairs.

"We have any number of amusing experiences, although some of them would try the patience of a saint," said a Chicago dealer to a newspaper reporter. "People will come to us who think we have enough information if they give us the name of their stove. An Irishman walked into our place the other day. He was one of those positive Irishmen who think it impossible to make a mistake.

"'Good mornin',' he began. 'Oi was laid off yisterday, an' Oi just came down to git some fixins for the stove. The ould woman's been lackin' for a new back this long toime.'

"'What kind of a stove is it?'

"'O, just a common ivery day stove.'

"'Does it burn coal or wood?'

"'It's a coal stove an' burns a divil of a lot of coal. Sure, it takes the best part of me wages buyin' coal.'

"'What is the name and number of it?'

"'No. 8 Star.'

"'Are you sure?'

"'Am Oi sure? Of course Oi'm sure. D'ye suppose Oi've sat in front of it for the last eight years an' not know what kind of a stove it is? Phat do you t'ink Oi am, a choomp?'

"'But there is no such stove made.'

"'Is that so? Maybe you t'ink you know more about it than Oi do an' ye niver sane the stove at all, at all'

"'Are you sure it isn't a Star No. 80?'

"'Sure? Of course Oi'm sure. Oi wouldn't have come down onless Oi knew phat Oi wanted. If you haven't got a No. 8 give me what you have got and Oi'll make it fit.'

"'But there are several kinds of Stars. Who is the maker, what is the date of the patent, and what is the size of the oven?'

"'An' do you have to know all that? Sure, the next toime Oi come down for a job loike this Oi'll sind some one else.'

"Then there is the 'handy' man, who comes in with a piece of string or a stick. There are knots in the string and nicks on the stick to show that the stove is 'so long and so deep.' When we tell him what is necessary before he can be accommodated he beats a hasty retreat. And there is the lady who thinks we are 'just horrid' when we tell her that we don't know what kind of a stove she has, that there are between 70,000 and 80,000 for which we have repairs, and that hers might be any one of them.

"The other day a German who keeps a second hand store was in here for some parts to two stoves that he had bought. He could not speak English very well, and as near as the clerk could make out the names of his stoves were the 'Sausage' and the 'Maggots.' As no such stoves were made to our knowledge, we were somewhat puzzled. Finally the catalogue was resorted to and the German triumphantly pointed out the names of his stoves. They were the Success and the Magnetic.

"Occasionally a man of the Spoopendyke order comes in. He wants a water front. He has the name and the details all right, and we give him tho part and suggest that we send a man to put it in for him. He declines our assistance, says he is used to these little jobs. He enjoys them. Besides, he isn't as big a fool as some people, who pay a man to do a simple little piece of work when they could save the money by doing it themselves. Next day he comes in crazy and wants to know what we mean by giving him the wrong front. Upon investigation it appears that he has taken out the fire brick all right, but has neglected to remove the shell, which makes the water front too large by about an inch.

"If people would be more particular to give us the right information they would have less trouble in having their stoves repaired."

ODD PLATES.

A "HARD TIMES" envelope of brown paper is used by the Michigan Stove Company in notifying their customers that a call will shortly be made by one of the company's salesmen. A sample of the notices thus mailed has been received. It is printed on parchment in two colors, red and black, and bears a remarkably strong resemblance to the ancient work of the early printers. The outside page of the notice has the word "coming" in bold letters, surrounded by an engraved design in leaf work. On the inside page the name of the salesman is given whose visit is to be expected. The whole arrangement is unique and attractive.

WEIR STOVE COMPANY, Taunton, Mass., are bringing out two sizes of a new square parlor stove known as the Grand Glenwood, highly ornamented both in the castings and nickel work, and designed for a high grade stove.

GEO. L. ROOD, representing the Royal heaters, manufactured by Hart & Crouse, has removed to 79 Lake street, Chicago. His new quarters are on the ground floor, presenting improved opportunities for displaying his goods and greatly facilitating the dispatch of business.

B. W. DODSON, late second vice-president of the Detroit Stove Works, has retired and is not now connected with the stove business, in which he has figured so prominently for years.

TAUNTON IRON WORKS COMPANY, Taunton, Mass., continue to offer the Quaker Prize range in four sizes, fitted with either plain, draw center or triangular grate, and having, it is claimed, a perfectly ventilated oven. This concern are sending to their customers a life sized *papier-maché* figure of a Quaker, which is very durable and makes an excellent show card for inside or outside use.

W. M. SHADDINGER, secretary and Western manager of the Detroit Stove Works, has removed to Chicago and will hereafter give personal attention to the details of the Chicago branch house, at 2921 to 2929 La Salle street.

THE EMPLOYEES of the Corning Stove Company, Corning, N. Y., expressed their pleasure at Postmaster Drake's confirmation, recently, by a vigorous use of the whistle attached to the plant.

THE BUSSEY & MCLEOD STOVE COMPANY, at Troy, N. Y., shut down their plant last week owing to the fact that orders were slack and some difficulty was experienced in getting coke.

THE NEW YORK STOVE WORKS, Peekskill, N. Y., are sending out circulars showing their varied line of gas hot plates, sad iron heaters and ovens. They are also making a portable gas appliance that is adapted for use with coal ranges, both for cooking on the top and baking in the oven.

THE STORE of the Mount Penn Stove Works of Reading, Pa., at 111–113 North Second street, Philadelphia, Pa., makes a fine display of gas stoves, gasoline stoves and refrigerators, their coal ranges being attractively arranged to create a demand at a later season of the year.

NORTH DIGHTON CO-OPERATIVE STOVE COMPANY, North Dighton, Mass., will soon bring out in all regular sizes a new medium priced range, known as the Oakland A. It will be fitted with any style grate desired and will have a nickel top rail and an elevated shelf.

F. M. BORDEN & BROTHER, 118–122 North Second street, Philadelphia, Pa., note a substantial increase in the demand for gas cooking apparatus this year. They make a specialty of the Reliable gas ranges and Game gas hot plates. These, with gasoline goods and the Challenge Iceberg refrigerators, furnish them a lively trade. The Erie aluminum tea kettle is attracting considerable attention with their trade, and increasing sales are the result.

J. ELWOOD YEAGER, manager of the Yeager-Hunter Spring City Stove Works, at 56 North Second street, Philadelphia, Pa., is showing a new range of the New Era series. It is a high oven square range of handsome appearance. The new features are sheet flue construction, which insures satisfactory operation, and a cut top, which avoids the possibility of the top cracking from heat, and is so constructed as to preserve the top level continuously. The range has a handsome nickel name plate and a nickel hearth, will all the conveniences and appurtenances of high grade goods.

THE CORNING MFG. COMPANY of Corning, N. Y., are meeting with a good demand for the Victor hot air furnace, which they manufacture and which has now been on the market for a little more than two years. Last season the sales in Corning of the heater were about two and a half times those of the year before. The business is growing to such an extent that the manufacturers have added a larger size to their assortment—the varieties now including Nos. 40, 43, 45, 50 and 60. A folder which reaches us from the company illustrates and describes the Victor hot air furnace, and also gives a few of the names of those who have used the heater.

WHITE, WARNER & CO., Taunton, Mass., report a very good sale for their new range, the Household Star, a medium priced stove made in two sizes and fitted, as are all Household ranges, with the White patent grate, which sifts the ashes and shakes the fire thoroughly at the same time.

ROBERTS, WINNER & CO., proprietors of the Quakertown Stove Works, Quakertown, Pa., have added to their assortment of goods two new ranges and a parlor stove. The latter, known as the Menlo, is made in two sizes, either straight draft or revertible flue. The ornamentation is of a pleasing character, the nickel top being so arranged that it may be taken off without removing any bolts or nuts. The new ranges are the Belmont and the Tip Top. These embody the modern improvements, are decorated in an effective style and are offered in several sizes. The goods have been well received during the short time they have been on the market, and the manufacturers expect for the Menlo a hearty reception upon its first appearance.

THE PORTLAND STOVE FOUNDRY COMPANY, Portland, Maine, have just brought out a high grade range called the Atlantic Grand. It is a high art range, designed in clay, has a new combination, low and high shelf and all the latest improvements in range construction. In ornamentation it is particularly rich and neat, gaudy and cheap looking effects having been carefully avoided. The edges are polished and the name plate nickel.

THE MARCH-BROWNBACK STOVE COMPANY of Pottstown, Pa., have opened a sample room at 312 Cherry street, Philadelphia, under the management of William M. Brownback, where they are showing a full line of all sizes of Crown hot air furnaces, steam heaters and hot water heaters. The location is a good one, and the new departure will undoubtedly be appreciated by the trade and others desirous of examining and placing orders for Crown heaters.

THE DETROIT STOVE WORKS of Detroit, Mich., are represented by a Jewel gas range in operation at the Pure Food Exhibition now being held at the Auditorium. The stove is situated in the kitchen, in the gallery of the exhibition, where the cooking of all foods required in the demonstrations is done and lectures on high art cookery given by Mrs. Rorer.

R. E. DIETZ COMPANY, 76 Fulton street, New York, report an increased demand for gas cooking apparatus, and are displaying a line of Dangler, Quick Meal and Cort ranges, besides a variety of hot plates and gas cooking appliances. They are showing the Dietz oil stove in all its various forms and report good sales.

THE EXCELSIOR STEEL FURNACE COMPANY, Chicago, Ill., shipped to Boston this week a carload of their furnace fittings, and included in the shipment a large number of oval stacks which they got up especially for the Eastern market and will hereafter make and carry for the Eastern and New England trade.

AT THE ANNUAL CONVENTION of the Western Gas Association held in Cleveland recently an interesting feature was the exhibition of gas burning appliances. The display was arranged in Army and Navy Hall and included exhibits by George M. Clark & Co., Schneider & Trenkamp Company, Standard Lighting Company, Cleveland Foundry Company, Wolff Gas Radiator & Mfg. Company, Dettlebach Stove Company, Taylor Burner Company, Miller Grate Company, Van Wie Stove Company, Maryland Meter Company, Milwaukee Gas Stove Company, Dan-

gler Stove & Mfg. Company, Favorite Stove & Range Company, Triumph Heating & Lighting Company, Gas Appliance Exchange, Western Gas Connection Company, Sloss Electric Gas Lighter Company and the Chicago Gas Stove Company.

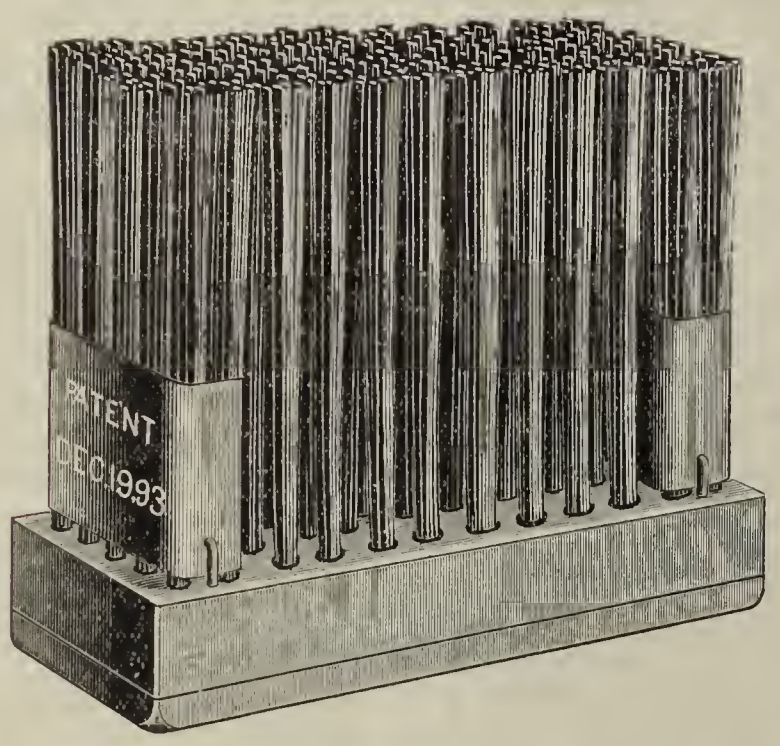
EDWARD ATKINSON of Boston, Mass., has issued an eight-page pamphlet descriptive of a new cooker which he has recently devised. The apparatus is referred to as being the most simple and effective, with the exception of what is known as the Standard Aladdin oven, which the inventor has brought out, and it is illustrated by means of sectional views in the pamphlet mentioned. The new cooker consists of a tin lined wooden box 1 or 2 inches thick, and designed to be placed bottom up on a metallic table, to which it is hinged. In the center of the table over which the box is placed is a hole 2½ inches in diameter, through which the top of a lamp chimney projects. Over the hole in the table is a double tube which is open at the bottom immediately over the top of the lamp chimney. The upper part of the tube supports a plate, the arrangement being such that it may be turned upon the lower tube so as to permit the heat from the lamp to pass directly into the box through openings provided for the purpose, or the upper tube may be turned upon the lower one so as to close the openings. In operation the box is tipped up and the cooking vessel placed upon the plate supported by the tube over the opening in the table, after which the box is lowered into position, forming an oven which, it is claimed, gives very satisfactory results.

EDWIN A. JACKSON & BROTHER, 50 Beekman street, New York, are displaying some handsome pieces of artistic wrought iron work. These goods comprise picture frames, easels, lamps, chandeliers and lanterns, fire stands, wood holders, and various designs of fire dogs. Three very handsome fire dogs represent storks and dragons. A set of dragon andirons in their window is particularly handsome in the dead black finish and gold bronze.

THE NEW YORK OFFICE of the Matthews & Willard Mfg. Company, 40 Murray street, in charge of F. M. Randell, makes a handsome display of onyx lamps, tables and cabinets and artistic metal goods. The house makes a full line of bronzes, urns and ornaments for stoves and stove trimmings in addition to the attractions shown at this branch.

Rice's Patent Bridled Foundry Brush.

It is a well-known fact that the drawn steel wire employed in foundry brushes is apt to break at the ends. The breaking at this point is greatest, owing to the fact that the wires are more free to vibrate than in the center, where they are largely prevented by contact with each other. If there was no more vibration at the ends than at the central portion of the brush, the end wires would break no sooner than the others, and the whole brush would wear uniformly until too short for further use. For the purpose of remedying this difficulty, the Rice Mfg. Company of New Durham, N. H., have placed a band or bridle around the end rows of the brush in such a way that while hinged to move freely and retain all the flexibility of a common brush, it catches the outside wires as they spring forward and immediately stops the vibration, which would otherwise continue. From an inspection of the engraving which we present herewith, it will be noticed that the bridle is fastened to the block in such a way that it can move freely on the hinge points. The manufacturers state that this device is cheaply applied and adds greatly to the durability of the brush, tests showing this durability to be twice and in some cases three times that of an ordinary brush.



Rice's Patent Bridled Foundry Brush.

The contract by which the Panama Railroad Company have been operating the steamers of the Pacific Mail Steamship Company, plying between New York and Colon, expires in June, and will not, it is announced, be renewed. The Panama Railroad officials have made arrangements to charter the three steamers of the late Brazil Mail Steamship Company, and now owned by the Standard Oil Company, from June 15. It is not unlikely that the move may lead to a sharp rate war.

Utilizing Blast Furnace Slag.

The disposition of blast furnace slag has long been a source of considerable trouble and expense to blast furnace operators, especially to those concerns who are compelled to remove it a considerable distance from the furnace. However, if a process for the utilization of this slag, shortly to be tried at the blast furnaces of the Edgar Thomson Steel Works, at Bessemer, Pa., proves successful this trouble and expense will not only be removed, but will enable the pig iron maker to realize a profit instead. In February last the Carnegie Steel Company, Limited, placed a contract with the Roberts Mfg. Company of Pittsburgh, builders of steel link belting conveying and elevating machinery of all kinds, for the construction of some elevating and conveying machinery of special design. This machinery has been completed and delivered at Bessemer, and is now awaiting a preliminary test, which will be made just as soon as some necessary changes in the railroad tracks, now under way, have been completed. With this machinery it is proposed to take the slag from Furnace D and treat it in such a manner as will make it suitable for railroad ballast, foundations, roadways and other purposes. Briefly, the process consists in taking the hot slag into a series of iron pans, from which it is conveyed to a crusher, where it is broken into cubes 1¼ inches in size. After being reduced in this manner it is taken to a horizontal pan conveyor, which delivers it to an elevator. It is then delivered to a shaking grate, which clears away all dust and dirt, after which the material is loaded on cars run under the elevator and is ready for shipment. Should the initial test prove successful, contracts will be placed for such additional machinery as may be required to treat the slag from the nine furnaces at Bessemer. The machinery now awaiting test is said to be capable of taking care of 300 tons of slag per day.

The largest check valve ever made has just been completed at the works of the Ludlow Valve Mfg. Company, Troy, N. Y., to be used in the main water supply pipe in the city of Pittsburgh, Pa. The total weight is 52,375 pounds. The valve was cast in two sections, which when bolted together made the valve stand 13 feet and 7 inches high, its greatest circumference being 32 feet 6 inches. The iron of which this valve was made when tested showed a tensile strength of 34,450 pounds per square inch. The bronze showed a strength of 39,250. The thickness of iron in this valve was $4\frac{7}{16}$ inches. Under a pressure of 500 pounds per square inch, the actual pressure on the gate plate of the valve was 3,454,325 pounds. During the recent depression in business this company have been running on full time with a full force of men.

Judge Coxe of the United States Circuit Court of Southern New York, has granted an interlocutory decree at final hraring perpetually restraining William D. Hoffman from infringing the patents 404,332, 430,058, 465,349 on magnetic separators granted to Clinton M. Ball and Sheldon Norton, the property of the Magnetic Separator Company.

At a sheriff's sale lately, in Reading, Pa., the franchises, property, &c., of the Reading, Lancaster & Baltimore Railroad were sold for $65.

TRADE REPORT.

The Iron Market.

The fuel question is the one of absorbing interest to the Iron trade throughout the country. The scarcity of Coke has led to the closing down of all but a few of the furnaces in Pittsburgh, all in the Mahoning Valley and the Wheeling district, all but one in the Shenango Valley, and nearly all in Central and Northern Ohio. It is really only the Chicago district among all west of the Alleghany Mountains which has not been affected.

An increasing number of mills in the West are idle or are close to the end of their fuel supply, and some of the Eastern mills are finding it very troublesome to get enough gas coal for their producers. The result is that prices along the whole line of Finished Iron and Steel are firmer, and for the time being cut throat quotations are not being made. But as yet there has been no general or substantial advance, nor any improvement in price in proportion to the rise in values on spot raw material. Buyers show very few symptoms of alarm, and sellers are by no means confident. In many cases the fuel shortage, which restricts production, acts also in curtailing consumption.

It remains to be seen whether the deferred demand will be large enough when the trouble is over to keep the furnaces and mills so busy for a considerable period that they can hold out and get higher prices. Each week of enforced idleness will add to the chances in that respect, but as yet only the first feeble indications of it have appeared.

It is probable that a determined effort will be made at an early date to get the Connellsville Coke ovens into blast. So far as the soft Coal situation is concerned, the general conviction is that little can be expected in the way of settlement from the Cleveland conference.

Pig Iron.—There is a little more inquiry in the New York market, and on the part of sellers a tendency to abstain from forcing the market. Foundry Coke is getting scarce, which is interfering with melting. Negotiations are pending for round blocks of Bessemer Pig. We quote standard brands $12.50 @ $13.25 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.75 @ $10.25.

Philadelphia advices indicate no special change in Foundry or Mill Irons, the supply being large, the demand light and sellers anxious for business. Prices vary according to circumstances, but standard brands command about last week's figures, say $11.50 for No. 2 X and $10.50 for Mill Irons, some a little more, some a little less, according to quantity, quality, delivery, settlements and other considerations incident to each particular case. General quotations for Philadelphia and near by points are about as follows:

Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.25 @ 11.75
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 11.75
No. 2 Soft	10.75 @ 11.00

In the Chicago market sellers of local Coke Iron report that they have just had the best week's business for a month. It has not grown out of a general improvement, however, but the business has been placed by foundrymen here and there who have secured more orders for their products and are consequently covering their requirements. Good inquiries are still in hand, and prospects are excellent for a continuance of the buying movement. Concessions in prices are no longer being made, but on the other hand some effort is perceived to mark prices up a trifle. Southern Coke Iron is quiet, but some figuring is being done on a few fair sized inquiries. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10.50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.60 @ 13.50
Southern Silvery, No. 1	@ 11.50
Southern Silvery, No. 2	@ 11.00
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern, No. 2, Soft	9.75 @ 10.00
Tennessee Charcoal, No. 1	15.00 @ 15.50
Tennessee Charcoal, No. 2	14.50 @ 15.00
Alabama Car Wheel	17.85 @ 18.00
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	12.50 @ 13.00

The very limited demand for Foundry Iron in the Pittsburgh district has prevented any advance being obtained for it. A number of furnaces in the two valleys that have heretofore made some Foundry Iron will run on Bessemer altogether when the Coke strike is ended. They say the demand for Foundry is so limited that it does not pay any longer to make it. The supply of Bessemer Iron in Pittsburgh and vicinity is about exhausted. Quotations are given as follows for close delivery:

No. 1 Foundry	$11.10 @ $11.25, cash.
No. 2 Foundry	10.50 @ 10.75 "
No. 3 Foundry	9.75 @ 10.00 "

Our Cincinnati reports indicate little change in the Pig Iron market at that center. Consumers who have Iron coming to them on contracts are a little more urgent to have them filled, and there are no large offerings for present or forward delivery. There is no difficulty in obtaining enough material to meet the current demand, which is of a jobbing character. There is no large consumption; even the Iron Pipe works are melting comparatively little Iron. The Stove works are working on short time. Agricultural works are doing comparatively little and contemplate an early season, so that the reduced output of Pig Iron by the furnaces is not causing the hardship to consumers which might have been expected. The demand is mainly for Coke Foundry Iron. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

There is no large business doing in the St. Louis Pig Iron market, where the Coal strike has had a hardening tendency on prices. The consumption of Iron is not heavy, many concerns running only half time and others even less. The local Stove manufacturers are not melting much Iron, and judging from the stocks of finished goods they have on hand, will not be compelled to increase their consumption of Iron very largely. The outlook is a trifle better, but cannot yet be called encouraging. Quotations are as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$10.75 @ $11.00
Southern Coke, No. 2 Foundry	9.75 @ 10.00
Southern Coke, No. 3 Foundry	9.50 @ 9.75
Southern Car Wheel	16.75 @ 17.75
Lake Superior Car Wheel	16.25 @ 16.50
Ohio Softeners	14.25 @ 14.50

Metal Market.

Pig Tin.—Prices have dropped somewhat and the market shows rather unsettled tone, attributable in part to lower London quotations by wire. The arrivals here have been fairly large, amounting in the past week to 425 tons. This, with 550 tons reported cleared from English ports, would seem sufficient to relieve anxiety of any immediate shortage in the supply in this market. Buying for consumption is referred to as being of very moderate volume. Jobbers' prices for small lots have been reduced to 20¾¢ @ 21¢ per ℔ for Straits Pigs and 21¼¢ @ 22¢ for Banca.

Copper.—Slow business, tame interest on the part of buyers generally and rather soft undertone to values covers about all that there is to be noted in the way of feature so far as the local market is concerned, but lower London quotations are, at the least, slightly significant as bearing upon the general situation. The appearances are that there is more than enough copper to go around. The ruling price asked by dealers for small quantities of Lake Ingot is 10½¢ ℔ ℔.

Sheet Copper.—The demand for Cornice Copper does not expand to any visible extent, and the market is dull and disappointing. Prices are inclined to weakness, while manufacturers are actively seeking orders. Some of the largest Copper works are running only on partial time pending a turn for the better in the demand.

Pig Lead.—The market has been weaker and lower cost has not lubricated the wheels of business in any marked degree. Consumers manifest extreme indifference, orders being, in the main, of a small and insignificant character. American Pig in small lots from store is quoted by jobbers gen-

erally at 3⅞¢ @ 4¢, the bulk of business being done at the lower figure, or even a trifle less.

Lead Pipe and Sheet.—Little beyond a feeble and perfunctory business is noted in Manufactured Lead in this section. The restricted character of dwelling house building operations now in hand gives small promise of any immediate expansion of the demand for plumbers' supplies. No great improvement is looked for in this quarter before the fall. While discounts are nominally maintained at the list rates, prices are said to be inclining to softness in some quarters.

Spelter.—Some effort was made to move prices upward on the strength of reports of smaller production and concentration of supplies, but the market subsequently relapsed in a manner rather surprising to dealers and there has been pronounced softness since, indicating that the available supply is quite sufficient. Besides being weak in tone, the market is dull here, sales being almost entirely confined to comparatively small quantities for present consumption. For small jobbing parcels of ordinary Western Spelter the ruling price is 4¼¢ ℔ lb, with the usual premium on fancy brands. Stocks in first hands are not heavy, and any strong demand would quickly absorb what Spelter there is unsold.

Antimony.—Aside from routine jobbing business little has been done in this metal, and the market is rather soft. In small lots Cookson's is quoted at 10¾¢ and Hallett's at 10¢ ℔ lb.

Nickel.—Prices have undergone no radical change. The extremes are 45¢ @ 55¢, according to size of lot, &c. The demand is of ordinary character.

Tin Plates.—The market has shown little or no improvement over that of last week, although slightly more interest has developed in favored deliveries. Inquiries have, however, crystallized into but very moderate business so far. Can makers seem to be behindhand with their purchases, notwithstanding that canning prospects are reported to have improved. Consumers appear to be postponing the filling of requirements to the last possible moment, in view of tariff changes. Such contracts for future delivery as are made always contain a proviso in regard to duty. Spot business shows no increase in aggregate volume and has been irregular, with very close figuring on prices the rule. If anything, the buyer still holds the advantage, although stocks here are only fair and the assortment rather poor. A temporary scarcity is noted in some lines of imported Plates, particularly those of special sizes. Roofing Ternes show the most activity, and American manufacturers of this material are said to be well supplied with orders. In the West Tin Plates are reported to be moving freely. They are still scarce in the Chicago district, and jobbers are regularly advising their traveling men of actual stocks on hand, so that no sales will be made which cannot be immediately filled from stock.

Sheet Iron.—Although jobbers in this vicinity speak of almost absolute stagnation in the demand for Sheet Iron, the mills are said to be well supplied with orders, and are mostly reported as busy. Scarcity of fuel, in consequence of the strikes, is likely to cause the shutting down of some of the mills, however, within the coming week. On the strength of a threatened contraction of output prices for galvanized sheets have hardened during the past week, and Black Iron makers are also said to be contemplating an advance.

Chicago Report.

Scrap.—The trade in Old Material shows no sign of improvement. Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Business is very quiet. The scarcity of soft coal has not yet driven trade to anthracite. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

Trade Notes.

BURGESS SOLDERING FURNACE COMPANY, Columbus, Ohio, advise us that business for the past three months has been very good, and they refer hopefully to the outlook for the future.

D. M. STEWARD MFG. COMPANY, Chattanooga, Tenn., report the demand for goods in their line as fairly good, orders, while smaller than usual, being more numerous. They state that they are constantly adding to their customers in Crayons and Pencils, and that orders keep coming in at such a rate as to preclude the possibility of getting a stock ahead, the company being sometimes three or four weeks behind orders.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, present some statistics in their advertisement this weeek. They state that over 5,000,000 feet of hot air pipe are used yearly, or over 1000 miles, equivalent to over 3 miles for every working day. They modestly say they would like to make all this pipe, and we believe they are sincere in their wish.

IRA G. LANE, 207 East Sixty-fourth street, New York, sends us an attractive card devoted to the National Revolving Chimney Tops, which he manufactures. These are designed for use on top of chimneys which are troubled with irregular drafts from various causes.

H. H. LINDEMUTH of the Raymond & Campbell Mfg. Company, Middletown, Pa., has invented and is about putting on the market a tool which will readily commend itself to the trade. It is a pipe reamer for beveling the ends of pipe after it has been cut. Few fitters realize the actual decrease of the bore in pipe where the ends are turned up in cutting, and many cases of supposed miscalculations are traceable to this source. With the new tool a bevel is given to the inside ends, which insures an unobstructed connection and consequently a full way. The tool will be made in two sizes, No. 1 cutting pipe from ¼-inch to 2-inch and No. 2 2-inch to 4 inch. We understand the price of the article will bring it within the reach of the whole of the trade.

J. HERBERT HIGGINS and Caleb M. Andrews have formed a copartnership for the purpose of carrying on the scrap iron, metal and turning business at 79 to 83 Mathewson street, Providence, R. I., under the name of J. H. Higgins & Co.

THE PHILLIPS TIN PLATE COMPANY, makers of tin and terne plates, and F. R. Phillips, have removed their offices to 918 Filbert street, Philadelphia, where they have leased for a number of years more commodious and suitable quarters for the proper display of their manufactures in tin and terne plates and proper facilities for exhibiting the various improvements in tin plate machinery now introduced and to be put on the market at an early date. W. Vernon Phillips will have charge of the tin plate company's department at their new quarters and F. Rees Phillips will assume charge of the company's works. F. R. Phillips will attend to the tin plate machinery, rolling mill, iron, steel and metal brokerage business.

The voyage of the Government torpedo boat "Cushing" from Washington to New York, last week, without touching the waters of the Atlantic, furnished a good illustration of the value of inland waterways for the transfer of war vessels from one point on the coast to another in time of war. The "Cushing" started down the Potomac River to Chesapeake Bay, proceeded up to Chesapeake City and thence crossed by the canal to the Delaware River, continued north to the Delaware and Raritan Canal, and by way of the Raritan River and Bay entered New York waters. She carried weight equivalent to her full equipment in time of war.

As the result of investigations recently made by the Commissioner of Navigation, that official estimates that Americans own and operate under foreign flags a steam tonnage equal to or greater than one-half the steam tonnage registered under the American flag.

Penny in the slot machines have been put under the ban in Chicago.

CONDITION OF THE

Hardware Trade.

THERE is a good deal of complaint on the part of manufacturers and jobbers in regard to the condition of business, the demand being only moderate and considerably less than the average. Reports from the retail trade indicate a relatively better business, though it does not, on the whole, attain to the usual volume. There is a fair demand for seasonable goods, but even these are not going quite as freely as when better general conditions prevailed. There is comparatively little building, though there are indications that there will be an increase in this direction, and Builders' Hardware is perhaps, on the whole, in somewhat better demand. Profiting by the experience of the past year, the trade are pursuing a careful policy and are avoiding purchases beyond their necessities, preferring to keep stocks low, and in some cases broken, rather than incur indebtedness in the discharge of which they may have difficulty. The condition of the market in regard to prices encourages this policy. The trade realize that during the past year, and even since January 1, there has been a perceptible shrinkage in the values of many lines, and they naturally desire to avoid further accumulations of stock, which may possibly be depreciated on their hands. Jobbers and manufacturers generally recognize the wisdom of this policy on the part of their customers, and are in many cases encouraging it by suggestions against overbuying when they see any disposition to do this. At the same time they are willing to make concessions in prices to houses of unquestioned responsibility, and as a result prices to close buyers are somewhat irregular and have on many goods a lower tendency. Comparatively few failures are reported or apprehended, the trade generally being regarded as in a sound and healthful state financially. The effect of the strikes is being felt to an increasing extent, and may have an important influence on production and prices of goods which lie near the raw material. The question as to the probable future course of the market is a difficult one, deserving careful attention on the part of the trade. Prices in many lines are exceedingly low, and it may be that in some cases they have touched bottom.

Advices from Chicago.—The volume of business in Shelf Hardware continues about as reported during the past two weeks. Jobbers characterize the condition of trade as very fair under the circumstances, although they say that they could handle a great deal more business without severely taxing their facilities. The demand now seems to be of a character which will be steadily maintained, as it rests entirely on the necessities of consumers and merchants. There is no speculation whatever in the buying which is now being done, and the break in freight rates to far Western points is not stimulating the demand from this jobbing center. Staple goods are comparatively quiet, except Barb Wire and Tin Plate, which are moving more freely than most classes of goods. Tin Plate is still scarce and jobbers are regularly advising their traveling men of actual stocks on hand, so that no sales will be made which cannot be immediately filled from stock. Heavy Hardware jobbers report a quiet condition of business with no prospects of an immediate improvement. The Indian warehouse established in this city was the point of much interest yesterday, owing to bids being received and opened for about $1,000,000 worth of supplies, in which are included large quantities of Hardware. Local manufacturers and merchants are very generally bidding.

Notes on Prices.

Wire Nails.—Owing to a variety of influences the Wire Nail market is in a perceptibly stronger position than at our last review, and higher prices are ruling. This is owing in part to the effect of strikes, which have either stopped or diminished the output of some of the mills, with a strong probability that still others will be similarly affected. There is also something of a quickening of the demand, which comes principally from the smaller trade buying in lots of one or two carloads, but at the same time it is understood that some of the large houses are in the market and will probably soon be obliged to replenish their stocks. The condition in the raw material also tends to stiffen the price. Under these conditions quotations for carload lots at mills are now $1 to $1.10, some mills refusing to sell at less than the latter figure. The price from other manufacturers is $1.05, but $1 is still obtainable. The market has a firmer tone, and it would not be surprising if a further advance were made, unless there is an early settlement of the labor difficulties. Small lots from store in New York are still quoted at $1.15 to $1.25.

Advices from Chicago.—The situation has now changed very decidedly in favor of manufacturers. Buyers can no longer dictate prices, but a firm basis has been established, with an advance of at least 10 cents per keg above the low rates prevalent some two weeks since. Factory lots are quoted at close to $1.10 Chicago. The manufacturers are very hopeful of advancing prices a little higher. They are encouraged in this belief by an improvement in the demand during the past week, including inquiries from large buyers who had been supposed to be well stocked. Jobbers quote small lots at $1.15, but report a rather light movement.

Cut Nails.—There has been little change in the Cut Nail market, but the effect of the strikes is perceptible, especially as manufacturers are indisposed to solicit business as eagerly as heretofore or to make concessions to induce orders. The factory price of Western Nails is about 90 cents, but concessions are made from this figure. This, during the past few weeks, had the effect of forcing down somewhat the price of the Eastern manufacturers. The Eastern mills are quoting 95 cents to $1 base for Nails delivered on dock in New York, their quotations for other points being based on a price at from 85 to 90 cents at mill. Small lots from store in New York are held at $1.10 to $1.15.

Advices from Chicago.—A nice run of orders is reported by Cut Nail manufacturers. They are selling for present delivery at the old price of 95 cents, Chicago, for 55 cent average, but will not enter contracts for future delivery, believing that prices will shortly advance on account of the scarcity of coal, as well as the expected restoration of freight rates to the East to their old figure. Small lots from stock are being sold by jobbers at $1.05 to $1.10.

Barb Wire.—The demand for Barb Wire continues fair, and the market is given a somewhat firmer tone in view of the effect of the strikes and the difficulty which is already experienced in operating plants. The advance in raw material also has its influence. On the other hand, trade is naturally diminished in volume and manufacturers are desirous of obtaining such orders as are in reach. Quotations for Four-Point Galvanized are as follows, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—The manufacturers of ordinary Barb Wire in this vicinity have not yet entirely caught up with business entered some time since and consequently are firmly maintaining prices. The scarcity of fuel and the advance in Billets they insist will compel them to ask advanced rates on new business. Jobbers are having an excellent demand for Barb Wire from stock, which continues without any relation to the demand for Wire Nails. Quotations for small lots from stock are $2.30 to $2.35, and $2.20 for shipments from factory.

Wire Cloth.—The trade are experiencing something of a scarcity in Screen Wire Cloth, and as a result prices are higher with such manufacturers or jobbers as have a supply on hand.

Apple Parers.—During the coming season Apple Parers will probably sell at prices not materially different from those which ruled last year, but there is an apparent tendency toward somewhat lower figures. The revised quotations of Reading Hardware Company, Reading, Pa., for the season of 1894 are as follows:

	Per doz.
Reading, '72	$3.75
Baldwin	4.25
Advance	4.25
Reading, '78	6 75

Little Giant Steel Truck.—The Little Giant Steel Truck, put on the market by the G. L. Van Namee Mfg. Company, Syracuse, N. Y., is sold to the trade at $24 per dozen, net.

Golden Crown Asparagus and Corn Cooker.—This article is put on the market by the Stuart & Peterson Company, Burlington, N. J., by whom it is sold at $1.40 for the No. 1, $1.60 for the No. 2, and $2 for the No. 3, these prices being subject to a discount of 40 per cent. to the trade.

Fresh Air Inlet and Hitching Post.—Edward M. Stirling, 85 Market street, Newark, N. J., is manufacturing this article, which was illustrated in our issue of April 28. It is sold to the trade at $12, less a discount of 30 per cent.

Frazer Axle Grease.—The following is the price-list of the Frazer Lubricator Company, 83 Murray street, New York, terms net, f.o.b. New York:

	Per gross.
Small wood boxes, gross lots	$9.50
Small wood boxes, half gross lots	10.00
	Per dozen.
Five-pound wood boxes, with bails	$3.25
Ten-pound wood boxes, with bails	6.00
Small tins, with bails	1.37½
Medium tins, with bails	2.75
Large tins, with bails	4.50

Bulk.

	Per pound. Cents.
Wood pails, 15, 25 and 32 pounds	5
Tubs, 36 and 71 pounds	4
Kegs, 112 pounds	3½
Half barrels, 225 to 250 pounds	3½
Barrels, 400 to 475 pounds	3½

Diamond X.

	Per gross.
Small wood boxes	$7.00
Small tins, with bails	14.00

Soldering Coppers and Irons.—In the revised discount sheet of the Covert Mfg. Company, West Troy, N. Y., the following terms are given on Soldering Coppers and Soldering Irons:

			Per cent. discount.
Soldering Coppers			35
Doz	$3.10	4.30	5.10
Nos	380	382	384
Doz	7.00	8.20	
Nos	386	388	
Soldering Irons			35
Doz	$5.20	6.25	7.50
Nos	350	352	354
Doz	9.50	10.75	
Nos	356	358	

Sheet Zinc.—A revised discount sheet under date May 10 has been issued by Matthiessen & Hegeler Zinc Company, La Salle, Ill. The base price, $4.50 per 100 pounds, remains unchanged, but revised discounts are announced as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	9	9	9	9
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	15	14	13	12

Glass.—A more active demand for Window Glass is reported from the West than in the East, local trade showing somewhat of a falling off within the past week or two. Firmer prices, the nearer approach to the time for the annual shut down of factories and the apprehension of a shortage of Glass during the summer months, have caused some factories hitherto idle to start up. Pittsburgh factory quotations are reported as being 85 per cent. discount for single and 85 and 5 per cent. discount for double strength Glass, while manufacturers generally show a disposition to maintain rather than to cut these prices. The discounts given fairly represent the market at large, with possibly concessions in some instances reducing prices to 85 and 5 per cent. discount for single and 85 and 10 per cent. discount for double strength Glass. French Window Glass is still quoted at 70 and 10 per cent. discount. Plate Glass is in somewhat greater demand, with prices ranging from 70 and 5 to 70 and 10 per cent. discount.

Old Metals.—The market for Old Metals is very tame, and dealings are on a narrow scale. The demand for Scrap Iron continues slack, but prices maintain their former level. The following quotations represent dealers' purchasing prices in New York City:

Heavy Copper	℔	lb	7½¢
Light and Tinned Copper	℔	lb	6½¢
Heavy Brass	℔	lb	5½¢
Light Brass	℔	lb	4½¢
Lead	℔	lb	3¢
Tea Lead	℔	lb	2¢
Zinc	℔	lb	2¾¢
No. 1 Pewter	℔	lb	14¢
No. 2 Pewter	℔	lb	7¢
Wrought Scrap Iron	℔ gross ton	$9.00 @	....
Heavy Cast Scrap	℔ gross ton	7.00 @	....
Stove Plate Scrap	℔ gross ton	4.50 @	....
Burnt Iron	℔ gross ton	3.00 @	3.50

Old Rags, Paper, &c.—The demand for this material has been good and prices remain steady at former quotations, namely:

No. 1 White Rags	℔	lb	3¼ @ 3⅛¢
No. 2 White Rags	℔	lb	2 @ 2¼¢
Mixed Rags	℔	lb	¾¢
Blues and 3ds	℔	lb	1 @ 1¼¢
Hard Sized White Shavings	℔	lb	2¼ @ 2⅛¢
No. 1 White Book Shavings	℔	lb	1½ @ 1¾¢
No. 2 White Book Shavings	℔	lb	1 @ 1⅛¢
Light Book Shavings	℔	lb	¾¢
No. 1 Mixed Shavings	℔	lb	¾ @ 1¢
No. 2 Mixed Shavings	℔	lb	½ @ ¾¢
No. 1 Printed Books	℔	lb	1 @ 1¼¢
Ordinary Mixed Books	℔	lb	½ @ ¾¢
Newspapers	℔	lb	2-5 @ ½¢
No. 1 Manila Paper	℔	lb	1 @ 1⅛¢
No. 2 Manila Paper	℔	lb	⅝ @ ¾¢
Bogus Paper	℔	lb	½¢
Common Paper	℔	lb	⅜¢
Straw Chips	℔	lb	½¢
Binders' Clippings	℔	lb	½ @ ⅝¢
Jute Butts	℔	lb	1⅞ @ 2¢
No. 1 Jute Bagging	℔	lb	1 @ 1¼¢
Mixed Bagging	℔	lb	¾ @ 1¢
No. 2 Bagging	℔	lb	½ @ ¾¢
Hemp Twine	℔	lb	2 @ 2¼¢
Manila Rope	℔	lb	2⅛ @ 2¼¢
Jute Rope	℔	lb	1½ @ 1¾¢
Mixed Rope	℔	lb	¾ @ ⅞¢

Old Rubber.—The market for Old Rubber is fairly active, but prices are irregular. The following quotations represent approximately dealers' purchasing rates, New York City delivery:

Car Springs, ton lots	℔	lb.	@ $0.03½
Rubber Shoes, carloads, delivered at factory	℔	lb.	@ .03½
Rubber shoes, less than carloads	℔	lb.	@ .03¼
Large Hose	℔	ton	@ 12.00
White Wringer Rolls	℔	lb.	@ .03¾
White Syringes	℔	lb	@ .03¾

Trade Notes.

HESS, SNYDER & Co., Massillon, Ohio, have just issued a Pump catalogue giving complete and detailed descriptions of their Novelty Force Pumps, which comprise a line suitable for shallow or deep wells, cisterns or for spraying purposes. The catalogue, in addition to the descriptions, with price-lists and tables of sizes, gives illustrations of the Pumps, and at the close attention is directed to Chimney Ventilators.

THE JERSEY CITY GALVANIZING COMPANY have opened a store at 112 John street, opposite Cliff street, New York, where they intend adding a general jobbing business in Plain and Galvanized Sheet Iron, Corrugated and Formed Sheets, Zinc, Spelter and Galvanized Specialties generally, as set forth in their advertisement elsewhere.

LISK MFG. COMPANY, LIMITED, Canandaigua, N. Y., issue circulars to the trade directing their attention to the fact that all of the goods manufactured by the concern are warranted not to rust. Quoting from their circular, they say: "We will make good this guarantee by replacing, free of charge, any articles which may be brought back to you in a rusty condition or prove otherwise defective. Should any such be found our agent will take pleasure in attending to the matter when he makes his next call." The firm also issue a large card notice to this effect, so that dealers may post it up in their stores, and all their customers may see the conditions. The Lisk Mfg. Company also send an official looking document headed "Guarantee," which certifies to the name of the agent for their patent anti-rust tinware and contains a copy of the terms of their guarantee, and is signed with *fac similes* of the autographs of the officers of the company.

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Metal and Miscellaneous Prices.

CHICAGO, MAY 17, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	$5.65 @$5.75
IC, 14x20, 90 lb	@ 5.25
IC, 14x20, 100 lb	.5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	..11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	.12.25 @ .....
IX, 14 x 20	.. 7.62½@ .....
20 x 28	..15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50
Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00
Each extra cross $2.00 and 20 x 28 double these prices.
Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra. IC, 14 x 20 ..... 7.25
Merion, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.50

Roofing Plates.

Palm, IC, 20 x 28 ..... @$11.25
Palm, IX, 20 x 28 ..... @ 14.00
Empire, IC, 20 x 28 ..... @12.00
Empire, IX, 20 x 28 ..... @15.00
Hickory, IC, 20 x 28 ..... @ 12.50
" IX, 20 x 28 ..... @ 15.50
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska IX, 20 x 28 ..... @ 17.75
Special, IC, 20 x 28 ..... @ 15.00
" IX, 20 x 28 ..... @ 18 00

Westmoreland:
IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.00

Elwood:
IC, 20 x 28 ..... $11 50

Kenwood:
IC, 20 x 28 ..... $11.50

Furmston:
IC, 20 x 28 ..... $11.00

Juno:
IC, 14 x 20 ..... $5.75
IC, 20 x 28 ..... 11.50

Illinois, Old Method:
IC, 20 x 28 ..... $17.00

E. L.:
IC, 20 x 28 ..... $12.50

Jessie:
IC, 20 x 28 ..... $12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resqnared, IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28 ..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20 ..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28 ..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia, IC, 14 x 20 (Stamped) 7.25
" IC, 20 x 28 (Stamped) 14.50
Maple, IC, 14 x 20 (Stamped) 6.75
" IC, 20 x 28 (Stamped) 13.50
Willow, IC, 14 x 20 ..... 6.50
" IC, 20 x 28 ..... 13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28 ..... 12.50
Globe, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
" IX, 20 x 28 ..... 15.00
" (Redipped), IC, 20 x 28 ..... 17.00

Old Process:
IC, 14 x 20 ..... 9.25
IX, 14 x 20 ..... 11.25
IC, 20 x 28 ..... 18.50
IX, 20 x 28 ..... 22.50

H. B. L., Old Style:
IC, 14 x 20 ..... 7.75
IX, 14 x 20 ..... 9 25
IC, 20 x 28 ..... 15.50
IX, 20 x 28 ..... 18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 3-10¢	3 1-10¢
17 to 20	₩ lb 2 4-10¢	3 2-10¢
21 to 24	₩ lb 2 5-10¢	3 3-10¢
25 and 26	₩ lb 2 6-10¢	3 4-10¢
27	₩ lb 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.
Patent Planished....₩ lb A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 75@5%

Copper—

Ingot.

Lake.....10½¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Disconnt on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.
Copper, Bronze and Gilding Tube, 3¢ ₩ lb additfonal.

Brazed Brass Tubing. (100 lb lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.36
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter ..... 4¢

Sheet Zinc—

600 lb casks ..... 4.50¢
800 lb casks ..... 4.70¢
Loose sheets ..... 4.80¢

Lead—

Soft Pig Lead ..... 4 ¢
Bar ..... 4½¢
Pipe ..... 5½¢, dis. 10¢
Block Tin Pipe ..... 35¢
Sheet ..... 6¢, dis. 10%

Solder—

½&½ ..... 13¢
Extra Wiping ..... 11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson ..... 13¢
Hallett's ..... 12¢

Wrought-Iron Pipe—

1¼ and under, Plain	60&10%
1¼ and under, Galv	52½&10%
1¼ and over, Plain	70&10%
1¼ and over, Galv	60&10%
Boiler Tnbes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	62½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive ..... dis 70&10%
Other sizes ..... dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list 50%

Steel Roofing—

Perfection ..... $3.50 square
Climax ..... $3.35 sqnare
The Lloyd Spanish Tiling ..... $4.50 sqnare

Metallic Shingles—

Cushman's ..... $1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz ..... $36.00 square
Tin ..... $9.75@$14.25 square
Steel, painted ..... $9.00 square

Drain Pipe—*Tile.*

Discount from list 70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb, 6 ¢
Linseed Oil, Boiled, in oils	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9½¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6¼¢
Red Venetian, Euglish, dry	$1.65@$1.70
Red Venctian in oil; asst'd cans, 8½¢; kegs	7¾¢
Sipe's Japan Oil, in bbls, ₩ gal	34¢
Spirits Turpeutiuc, in bbls., ₩ gal	34½¢
Asphaltum, Trinidad Refined, ₩ ton	$45
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, lb bbl. of 300 lb	$3.00

NEW YORK, MAY 18, 1894

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots ..... ₩ lb, 75¢
100-lb lots ..... ₩ lb, 73¢
Ton lots ..... ₩ lb, 70¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots ..... ₩ lb, 65¢
100-lb lots ..... ₩ lb, 60¢
Ton lots ..... ₩ lb, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:
Small lots ..... ₩ lb, 60¢
100-lb lots ..... ₩ lb, 55¢
Ton lots ..... ₩ lb, 50¢

Antimony—

Cookson ..... ₩ lb, 10¾¢
Hallett's ..... ₩ lb, 10 ¢

Brass—

Planished ..... net
Roll and Sheet ..... 25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.	
¾ in. up to 2-in	$0.35	25 @ 30%
5/8-in. up to ¾-in	.36	
½-in. up to 5/8 in	.38	
3/8-in. up to ½-in	.41	
5-16-in. up to 3/8 in	.48	
¼-in. up to 5-16-in	.65	
3-16-in. up to ¼-in	1.00	
⅛-in. up to 3-16-in	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 16, inclusive,	.38	

Copper and Bronze Tubing—

3¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized 60%
Galvanized, Locked Joints 60%
Tin 60%

Spiral Riveted—

Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₩ lb, net

Ingot.

Lake ..... 10½¢
Ansonia Grade Arizona ..... 10 ¢
Ansonia Grade Casting ..... 9½¢
Planished ..... net
Sheet and Bolt ..... 15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized ..... 60&10%
Lap or Slip Joint Terne 60%

Eave-Trough Mitres—

Lap or Slip Joint ..... list, net

Elbows—

Plain Adjustable—

Tin 70%
Galvanized 70%

Crimped Tubing—

Re-Tinned or Galvanized 35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20%

Elbows and Shoes—

Flat Crimp.

Tin 35%
Galvanized 35%

Corrugated.

Flat Crimp.

Galvanized 60%

Round or Square.

Tin 60%
Galvanized 60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2.50	2.80¢
Nos. 17 to 21	₩ lb. 2.60	2.90¢
Nos. 22 to 24	₩ lb, 2.70	3.00¢
Nos. 25 and 26	₩ lb. 2.80	3.10¢
No. 27	₩ lb. 2.90	3.20¢
No. 28	₩ lb, 3 00	3.30¢
American B. B.	₩ lb,	4¢@4¼¢

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ₩ lb, 11¾@12¾¢
Patent Planished....₩ lb, A, 10¢; B, 9¢ 5%
Craig Polished Sheet Steel ..... ₩ lb 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		75@75&5%
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig ..... 3¾¢@4¢
Bar ..... 4½¢
Pipe ..... 5¾¢, 20%
Tin Lined Pipe ..... 15¢, 20%
Block Tin Pipe ..... 37½¢, 20%
Sheet ..... 6½¢, 20%
Old Lead in exchange, 2¾¢ ₩ lb.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil: Raw, ₩ gal	@ .40
Linseed Oil: Boiled	@ .43
Spirits Turpentine: In bbls	@ .32
Putty: In barrels and ½ bbls	.01⅜ @ .01¾
Putty: In tubs	.01⅝ @ .01¾
Putty: In tin cans	.01½ @ .02½
Putty: In bladders	.01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ₩ ton ..... $30.00@$35.00
Asphaltum, Rock, ₩ ton $14.00
Coal Tar Felt, 1 Ply, ₩ lb ..... 2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft. $1.85
Roofing Pitch, ₩ bbl $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra	4¼¢	38½¢
Rock Wool, ordinary	2¼¢	27¢
Rock Wool, extra	7¼¢	43½¢

Rosin—

Common and Good—Strained,
Rosin, C. & D.....₩ bbl. $1.27@$1.28
Rosin, E. & F.....₩ bbl. $1.40@$1.65
Rosin, G. & H.....₩ bbl. $1.85@$2.15
Rosin, I. & K.....₩ bbl. $2.40@$2 75
Rosin, M. & N.....₩ bbl $2.90@$3.05

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.50@ 4.25
Peach Bottom, ₩ sqr.....5.00@ 6.25
No. 1 Chapman, ₩ sqr.....4.00@ 4.65
Lehigh Slates, ₩ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.70@ 3.20
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

¼& ⅓.....13½@14¢
No. 1.....11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢

Yager's Soldering Salts.
¼-℔ bottles, eacb.....30¢
Large quantities, per ℔.....40¢

Spelter— 15

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—Sce *Trucks, Stove,*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Sanca, pigs, ₩ ℔.....21½¢@22¢
Straits, pigs, ₩ ℔.....20½¢@21¢
Straits in bars, ₩ ℔.....22¢@22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20.....6.12
" IX, 14 x 20.....6.38
Apollo Roofing, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Atlantic, IC, 14 x 20.....5.75
Bonus, Extra Coated, IC, 14 x 20...6.75
" " " IX, 14 x 20....8.25
Buckeye, IC, 14 x 20.....7.00
" IX, 14 x 20.....8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20.....5.37½
Climax, IC, 14 x 20.....5.50
Columbia, IC, 14 x 20.....7.00
Daue, IC, 14 x 20.....5.59
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20.....5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28.....15.00
Empire, IC, 14 x 20.....5.75
Extra Central, IC, 14 x 20.....5.62½
Flag, IC, 14 x 20.....5.25
Fort Pitt, IC, 20 x 28.....11.00
Globe, IC, 14 x 20.....5.75
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20.....5.75
Kensington, IC, 14 x 20.....6.75
" IX, 14 x 20.....8.00
Knoxall, IC, 14 x 20.....6.00
Laufman's Apollo (Resquared), IC, 14 x 20.....8.12
Laufman's Apollo (Resquared), IX, 14 x 20.....9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20.....6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20.....7.00
Maple, IC, 14 x 20.....6.50
Merchant's Roofing (Resquared), IC, 14 x 20.....8.25
McKinley, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Newcastle Real Old Method, IC, 14x20.9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.25
N. F. Old Style, IC, 14 x 20.....7.50
" " " IX, 14 x 20.....9.00
Old Colony, IC, 14 x 20.....8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20.....5.25
Palacio, IC, 14 x 20.....5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20.....8.00
Phœnix, IC, 14 x 20.....5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20.....9.25
Scott's Extra Coated (Resquared), IX, 14 x 20.....10.75
Taylor Old Style (Resquared), IC, 14 x 20.....9.25
Taylor Roofing, IC, 14 x 20.....8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20....6.62
" IX " 14 x 20....7.88
U. S. Monongahela, IC, 14 x 20.....6.10
U. S. Redipped, IC, 14 x 20.....8.25
Venus, IC, 14 x 20.....5.37½
Vigilant, IC, 14 x 20.....5.50
Waldo Redipped, IC, 14 x 20.....6.75
Westmoreland, IC, 14 x 20.....6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20.....6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....6.75
Hazel, IC, 14x20.....5.80
Iowa, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Linden, IC, 14x20.....6.50
Merchant's Dipped, IC, 14x20.....11.00
Merlon, IC, 14x20.....6.75
Mint, IC, 14x20.....6.00
Newcastle Russia, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
Newcastle Juniati, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.50
Newcastle Best Coke, IC, 14 x 20....6.00
" " IX, 14 x 20....7.25
Newcastle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.75
Palma Xtra, IC, 14x20.....7.25
Phœnix, IC, 14x20.....6.25
" IX, 14x20.....7.75
Royal, Extra, IC, 14x20.....7.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Youghlogheny, IC, 14 x 20.....6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$7.50
20 x 28.....15.00
IX, 14 x 20.....8.75
20 x 28.....17 50
Pontymister Grade, IC, 14 x 20.....6 50
20 x 28.....13.00
IX, 14 x 20.....7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20.....5.75
20 x 28.....11.50
IX, 14 x 20.....6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....$5.37½
20 x 28.....10.70
IX, 14 x 20.....6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20.....5.25
20 x 28.....10.50
IX, 14 x 20.....6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade. IC, 10 x 14.....$6.37½
" " IC, 12 x 12.....6.62½
" " IC, 14 x 20.....6.37½
" " IC, 20 x 28.....12.75
" " IX, 10 x 14.....8.00
" " IX, 12 x 12.....8.25
" " IX, 14 x 20.....8.00
" " IX, 20 x 28.....17.00
" " DC, 12½ x 17.....6.00
" " DX, 12½ x 17.....8.00
Allaway Grade. IC, 10 x 14.....5.75
" " IC, 12 x 12.....5.87½
" " IC, 14 x 20.....5.75
" " IC, 20 x 28.....11.50
" " IX, 10 x 14.....7.00
" " IX, 12 x 12.....7.25
" " IX, 14 x 20.....7.00
" " IX, 20 x 28.....14.00
" DC, 12½ x 17.....5.50
" " DX, 12½ x 17.....6.50

Coke.

Steel Coke.—IC, 10x14, 14x20$5.25@$5.35
10x20.....8.12½
20x28.....11.00
IX, 10x14, 14x20.....6.60
B. V. Grade.—IC, 10x14, 14x20.....5.40

Imported Boiler Plates—

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets).....14.50
IXX, 14x31..(112 sheets).....16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....53½&10&5%
1½ and over, Plain.....70&10&5%
1¼ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 18.2..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks.....₩ ℔ 4⅝¢
Per ℔.....5¢ @ 5½¢

MANUFACTURING.

Hardware.

It is reported that a reduction in wages varying from 25 to 40 per cent. is to he made in several departments of the Winsted Edge Tool Company, West Winsted, Conn.

The Howe Scale Company, Rutland, Vt., have commenced running ou full time.

The capital stock of the Chelsea Wire Fabric Company, Chelsea, Mass., has been increased $10,000 by vote of the directors.

The Wisconsin Iron & Wire Works of Milwaukee, Wis., have been incorporated. The company succeed G. H. Norris in the ownership of the Reliance Wire Works, which Mr. Norris recently purchased from D. D. Williams. The capital stock of the new company is $30,000, and the incorporators are G. H. Norris, J. G. Beckley and J. H. Gilman. Mr. Norris is president of the company, Mr. Beckley vice-president, and Mr. Gilman secretary and treasurer.

Burgess Soldering Furnace Company, Columbus, Ohio, advise us that business for the past three months has been very good, and they refer hopefully to the outlook for the future.

D. M. Steward Mfg. Company, Chattanooga, Tenn., report the demand for goods in their line as fairly good, orders, while smaller than usual, heing more numerous. They state that they are constantly adding to their customers in crayons and pencils, and that orders keep coming in at such a rate as to preclude the possibility of getting a stock ahead, the company being sometimes three or four weeks behind orders.

E. Blair, Bucyrus, Ohio, advises us that he has sold 50 per cent. more swine jewelry during the first four months of 1894 than he did during the same period last year. Mr. Blair is making arrangements for the manufacture of another line of hog ringers.

A. J. Phillips & Co., Fenton, Mich., advise us that their sales of screen doors thus far this year are largely in excess of their total shipment last year. Their factory was in operation all through the fall aud winter with a full force and on full time and pay, in anticipation that when the season had arrived there would he the usual shortage iu screen goods, and perhaps more of a shortage than in former years. They state that screen goods are coming to be cousidered as staple articles and as almost of necessities, if the sales during this, an off year, count for anything, nearly all of the leading factories on screen doors being busy. A notable feature of the market this season is that screen doors of the better grades have been increasingly ordered, an unusually large number of fancy pattern screen doors having been devised. The ruuning of their factory during the fall and winter has enabled the firm to accumulate a very nice stock and assortment of window screcus and screen frames, and they think that their capacity will enable them to keep their assortment good until the end of the season.

Staudard Company, 57 Haverhill street, Boston, have enlarged and improved their well-known Dover egg beater, confident that its sale will be thereby increased.

Plumb, Burdict & Barnard, Buffalo, N. Y., having outgrown the plant they now occupy, have commenced work on their new factory at North Tonawanda. They hope to have the new works completed by the coming fall. The new plant will be operated by electric power.

John Sommer's Son, Newark N. J., refers to the favor with which his Boss lemon squeezers are received by the trade. These squeezers are described as made out of hard sugar maple, finely finished, with strong nickel plated hinges, overlapping ends and large smoothly polished lignum vitæ bowl. The cleauliness, durability and cheapness of these lemon squeezers are points which are made in regard to them by the manufacturer.

Levin Pruner Company, 37 Dey street, New York, advise us that their pruner has made its way into almost every country on the globe and that it has apparently come to stay.

Wabash Screen Door Company, Rhinelander, Wis., are having a much better business than they had any reason to hope for considering the times. They advise us that they are at this time fully up to last season's trade, and if business continues throughout the next sixty days, as the prospects now indicate, they will sell a larger number of screen doors this year thau ever before, the company estimating their output at over 325,000 doors. They state that the greatest surprise in this season's business is the increased demand for fancy doors or doors of better quality. Up to the preseut time they have shipped more fancy doors thau they did during the whole of last season.

Buck Bros., Millbury, Mass., have received a letter from Geo. S. Waite, superintendent of the Toledo Manual Training School, Toledo, Ohio, in which reference is made to the satisfaction which has resulted from the use of their tools in the school work. During the past eight years the school has purchased from Buck Bros. 100 sets of carving tools, 144 sets of carpenters' chisels and 72 sets of wood turning chisels. Some of these tools have been in use for the whole of that period and are referred to as having given splendid service.

Miscellaneous.

The Pittsburgh Crushed Steel Company, Limited, patentees and sole manufacturers of steel emery and crushed steel, have recently completed the erection of an addition to their plant 60 x 100 feet in size.

At a meeting of the board of directors of the Daniels Steel Railroad Tie Company, held in Youngstown, Ohio, on May 5, the resignation of Mr. Daniels as chairman of the concern was presented and accepted and Thomp Burton was elected to succeed him and is now holding the dual position of president and general manager. Hon L. C. Ohl was added to the hoard of directors and was elected vice-president of the concern.

The Appleton Mfg. Company of Appleton, Wis., have begun the work of removing their implement factory to Geneva, Ill.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A good TIN and SHEET IRON WORKER who has a fair knowledge of plumbing and iron piping; man with some experience in a hardware store preferred; must furnish reference from previous employer; steady job to the right man; small New England city. "Steady Job," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

A good STOVE PATTERN MAKER will find a steady job; state experience had and wages wanted. "G. R.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 19

Practical ENAMELER; one fully conversant with all branches in enameling cast and sheet metal ware and who fully understands the construction and operation of plant required; give experience and references; applications from experimenters will not be considered. "Manufacturer," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

A practical and experienced SUPERINTENDENT for a tin plate mill; one who is competent to oversee construction of mill and who can manage same when built. Address, stating experience, "Natural Gas," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

SUPERINTENDENT for a stove works; one capable of taking full charge of all departments; none but a first-class man of long experience need apply. Address with reference and state salary expected, "C.," No. 519, office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

FOREMAN in tin can factory; one having had some experience in figuring on work and knowing the brands and kinds of tin plates; capable of taking charge of 200 hands; first-class reference required. Holloway, office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

A FOREMAN for brass foundry working from four to eight men; preference given to a man who can break in green help, and who has worked on plumbers' supplies; steady position for the right man. "R.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

SITUATIONS WANTED.

By a practical, all around mechanic in all branches of the Hardware business, competent to design and make metal patterns, dies, tools, jigs, &c.; nine years as foreman in the above branches; good references. "Mechanic," P. O. Box 150, Harvy, Ill. May 19

A practical BRASS MOLDER, 25 years' experience on steam and water work, plumbers' supplies and general jobbing, desires a position to take charge of shop running from five to ten molders; can break in help; sober, steady man; good reference; location no object. "Brass Molder," 68 Beech street Paterson, N. J. May 19

Steady work desired by a good TINSMITH at furnace work, roofing and general jobbing; 20 years' experience; married. 11 South street, Troy, N. Y. May 19

As FOREMAN in tin and sheet iron works by thoroughly competent man; can manage any number of men judiciously. Charles Harvey, 251 Fourteenth street, Buffalo, N. Y. May 19.

By a competent man of 12 years' experience in the STEEL RANGE business, in all its branches. Harry Hellman, 516 Johnson street, Covington, Ky. May 19

By a good TINNER and GENERAL JOBBER at inside and outside work; steady and temperate; willing to work for moderate salary: city or country. S. Klinberg, 258 Delancey street, New York City. May 19

By a thoroughly competent TINSMITH; experienced in pipe, jobbing, pump work, hot water and steam heaters; capable of taking management of shop; steady, reliable and can come well recommended; at liberty June 10, or can come sooner if imperative. J. D. Francis, Bridgeport, Conn. May 19

By a young man as SHEET IRON WORKER, ROOFER add JOBBER; sober; wages moderate; six years' experience. "T. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

By a practical PLUMBER of 18 years' experience, on new or overhauling work, to take charge or work journey work; first-class workman, city or country. "Emmett," care of E. Moran, 181 East 111th street, New York City. May 19

By a CORNICE CUTTER; can furnish brake. "Cornice Cutter," care of Harter House, Anderson, Ind. May 19

By a first-class TIN and SHEET IRON WORKER; used to country work; can do roofing, furnace and pump work, general jobbing and slating; 12 years' experience at inside and outside work. J. Ditchfield, 171 Passaic street, Trenton, N. J. May 19

As FOUNDRY FOREMAN by a thorough mechanic of 25 years' experience in all branches of foundry work; first-class at cupola management and reliable where strict economy is desired; strictly temperate; first-class references. "Eastern," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

A HOT WATER and STEAM FITTER, a first-class mechanic, competent draftsman and estimator, having had seven years' practice, also a fair plumber, wishes to have a steady position the year round. W. W. Hawley, Soldiers' Home, Sandusky, Ohio. May 19

By a good TIN and SHEET IRON WORKER; steady job the year round. W. Zepp, 19 Gold street, Bridgeport, Conn. May 19

An American mechanic, married, 35 years old, temperate and reliable, wants steady position and good wages; anywhere; city or country; tin work in all branches; furnace, range and heater, mantel setting, cornice and skylights; 20 years' experience; reliable man; state wages. David Dotson, 43 Ormond place, Brooklyn, N. Y. May 19

By a practical PLUMBER and HOT WATER FITTER; married and temperate; best of references; will go to any part of the country; please state wages; steady work desired. "R. B. C.," care of John Flynn, 331 West Seventeenth street, New York City. May 19

Steady employment by a thorough PLUMBER and GAS FITTER; understands roofing and spouting; strictly sober. The Russell House, 76 East Eagle street, Buffalo, N. Y. May 19

By a good ROOFER and GENERAL JOBBER; ten years' experience. J. L. Daniels, Bath, N. Y. May 19

By a PLUMBER, eight years' experience. Arthur Wiskers, 1460 Third avenue, New York City. May 19

By a first-class PLUMBER, 15 years' experience; best of references. Scott, 163 East 104th street, New York City. May 19

SUPERINTENDENT, with 15 years' experience in foundry management, desires a position; am a practical molder, with thorough knowledge of ecouomical cupola practice; a good organizer, and can handle help to best advantage; thoroughly understand every department of foundries making stoves, ranges, hot air furnaces, hot water and steam boilers; first-class references "R. H. S.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

As a SPINNING IRON WORKER on tin and all kinds of stamped ware; 23 years' experience; can do anything in the line of spinning, trimming and beading; 17 years with the Iron Clad Mfg. Company. Chas. Seider, 263 Floyd street, Brooklyn, N. Y. May 19

By a married man of 13 years' experience as TIN and SHEET IRON WORKER, also slate roofer; can do any ordinary inside and outside work; wants steady job; state wages, &c. Box 7, Utica, Ohio. May 19

Young man with two years' experience in the retail hardware business, four years with the largest wholesale firm in the West, and well posted on hardware and prices desires a position; unquestionable references. Box 23, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 19

A first-class PLUMBER, STEAM and HOT WATER FITTER wishes a steady job in city or country. "C. E. McP.," 12 Willett street, New York City. May 19

By a first-class PLUMBER of long experience; understands plans and estimating; some knowledge of tin and sheet iron work; city or country. Jno. J. Shea, 207 East Seventy-sixth street, New York City. May 19

By a first-class TINSMITH and PLUMBER HELPER. Max Roren, 103 Broome street, New York City. May 19

By a first-class stove and steel range mounter as FOREMAN; have held similar position for past five years; best of references. Geo. Balles, 163 Mackinaw street, Buffalo, N. Y. May 19

By a good TIN and SHEET IRON WORKER; good knowledge of plumbing; can do all kinds of jobbing; city or country. "J.," 16 High street, Woburn, Mass. May 19

By a young man 20 years of age at PLUMBING; recent graduate of New York Trade School; regular habits and willing to work; will go as helper; speaks English and German. "C. K.," Box 138, College Point, L. I., N. Y. May 19

As PLUMBER by a graduate of the New York Trade School; can wipe a first-class joint; understands lead burning; good references. R. S. Sholer, Jr., Norwich, Conn. May 19

Under instructions, by a recent graduate of the plumbing department of the New York Trade Schools; not afraid of work; small salary. Chas. J. O'Hanlon, 391 Bridge street, Brooklyn, N. Y. May 12

By an Orange County TINSMITH; A1 milk can maker; understands all about creamery work, jobbing of all kinds and all the different branches of the trade; honest, sober and steady; best of reference. "Tinsmith," 552 Broome street, New York City. May 12

As FOUNDRY FOREMAN, by a practical molder who has had long experience on stove plate, hot air and hot water furnaces; competent in handling men to advantage; thorough knowledge of economical melting, and all modern foundry practice; first-class reference from present employers. "E. W. D.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

By a married American man 24 years of age; five years' experience in plumbing, gas and hot water fitting. "C.," Box 71, Dalton, Mass. May 12

A steady job at TIN and SHEET IRON WORK; general jobber on both inside and outside work, furnace and range work; 20 years' experience; city or country shop. N. T. Wood, No. 1402 Fairmount avenue, Philadelphia, Pa. May 12

As BOOKKEEPER, by a young man of 23; well acquainted with the retail plumbing business; seven years' experience. Albert E. Harris, 181 Dearborn avenue, Chicago, Ill. May 12

By a young man, at PLUMBING, who is a graduate of the New York Trade School and has had two years' experience in New York City; can furnish references. E. L. Plumber, 134 East Twelfth street, New York City. May 12

As SUPERINTENDENT of stamping works or FOREMAN, DIE or TOOL MAKER; 35 years of age; last six years in similar position with leading firm; thoroughly posted in sheet metal of all kinds; highest references. "Tools," care of Rudolphi & Krummel, 96 North Clinton street, Chicago, Ill. May 12

By a good TIN and SHEET IRON WORKER; 12 years' experience; city or country. Levy Himan, 329 Carpenter street, Philadelphia, Pa. May 12

A METAL PATTERN MAKER wishes a situation where he can have steady employment; is sober and reliable; used to filing and fitting stove work; also repairing; is a handy all round man. "J. M. D.," 11 Delevan street, Auburn, N. Y. May 12

As FOREMAN and CORNICE CUTTER; 20 years' experience at general job and cornice work; can hustle men and work stock to good advantage. "Estimator," 2331 Wabash avenue, Chicago, Ill. May 12

By a plumber as FOREMAN or JOURNEYMAN; capable of handling a good number of men; well acquainted with plumbing, heating and gas fitting; can estimate from plans; good references. A. Chisholm, West Saratoga street, Baltimore, Md. May 12

As SALESMAN; hardware or tinners' stock; 15 years on the road; acquainted in hardware, iron and wagon wood work. "Storrs," office of *The Metal Worker*, Fifth and Main streets, Cincinnati, Ohio. May 12

By a first-class stove mounter as FOREMAN; 21 years' experience at the trade; 15 years' experience as foreman; understands the business in all its branches; good references. W. H. Flockton, Plymouth, Mass. May 12

By a TRAVELING SALESMAN with a trade in Illinois; thoroughly understands sheet metals, tin plates, tinners' supplies, steel roofing and metal ceilings; A 1 references. "W.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 12

By a PLUMBER, GAS and HOT WATER FITTER; country preferred; reference if required; 24 years old; seven years' experience; no bad habits; willing to work hard; wages $2.50 a day. Wm. A. Loughrey, 196 Melrose avenue, Cleveland, Ohio. May 12

A perfect TIN and SHEET IRON WORKER and ROOFER wants a steady position in or out of town. S. Greenberg, 64-66 Canal street, New York City. May 12

By a first-class PLUMBER, steady work in city or country; thoroughly understands gas, steam, and hot water fitting. John J. Reilly, 203 East Thirty-sixth street, New York City. May 12

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SUPREME COURT.—In the matter of the voluntary dissolution of the W. F. Washburn Brass and Iron Works, a corporation, &c., notice is hereby given that at the factory formerly occupied by said corporation, at corner of Dock and River Streets, in the city of Yonkers, Westchester County, N. Y., on Wednesday, the 6th day of June, 1894, at 10 o'clock A.M., I shall sell at public auction all the plant and machinery of said corporation, consisting of machine tools, special tools, nickel plating outfit, patterns, flasks, furnaces, shafting, pulleys and the entire mechanical equipment of said corporation for the manufacture of plumbers' fine brass work. Terms made known at sale.

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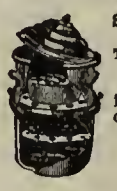
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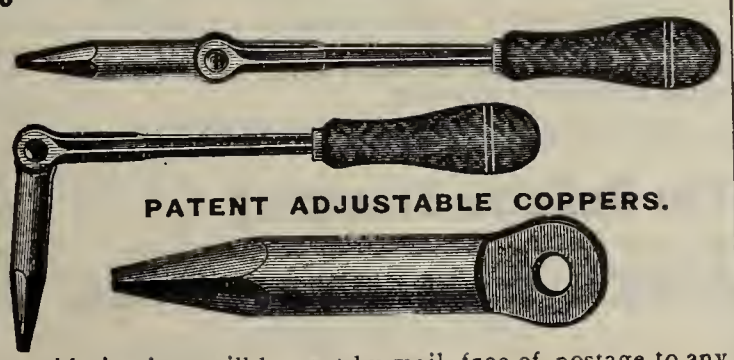
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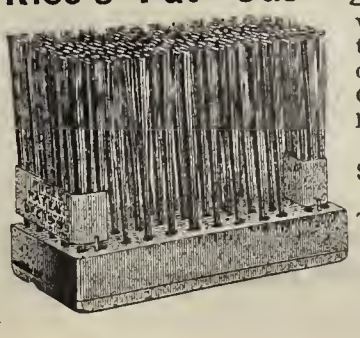
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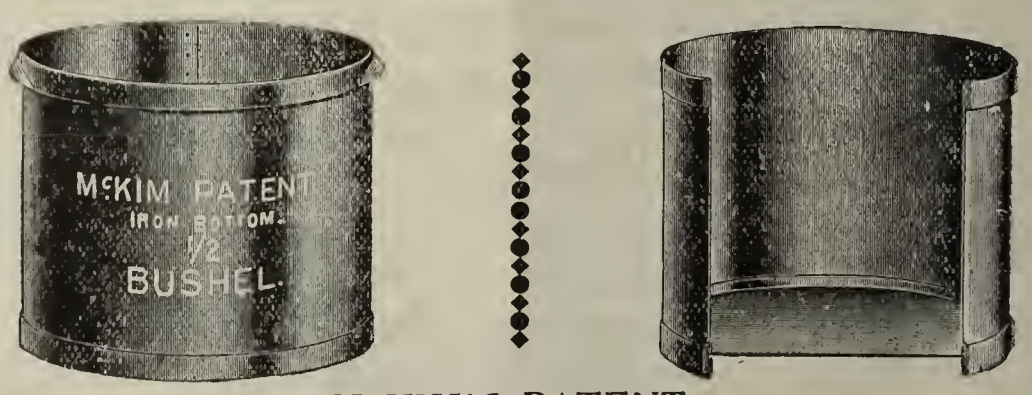
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WROUGHT STEEL GRAIN MEASURES.

STANDARD.

Capacity, ¼ peck, ½ peck, 1 peck, 2 pecks.

Nested or packed in single sizes.

This measure is without doubt the best article of the kind on the market. The bottom is fastened mechanically in the slot formed by the peculiar method of folding the bottom, which is clearly shown in the cut above. It is further strengthened by the band folded at the top.

It is made completely of solid steel and is warranted to outlast any other measure. Manufactured only by

The Bellaire Stamping Co., Harvey, Ill.

AMERICAN STAMPING CO..

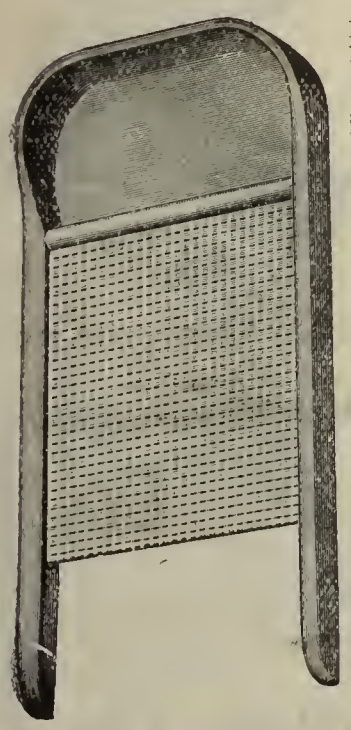
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104 and 106 John St.

FACTORY,
103 to 119 N. 3d. St., Brooklyn, E. D., N. Y.

The Utility Washboard



Is a Zinc Board made from best quality No. 6 Zinc, the heaviest and strongest Zinc in use for Washboards.

CRIMP—The Crimp is our Improved Deep Globe, acknowledged far superior to any now in use on other boards.

OFFERS—absolute protection from water at sides as well as the top of the soap board.

WHY?—Because being made of one piece which is bent thin and broad at the sides and top of soap board where all splashing occurs, it is impossible in washing to splash over it.

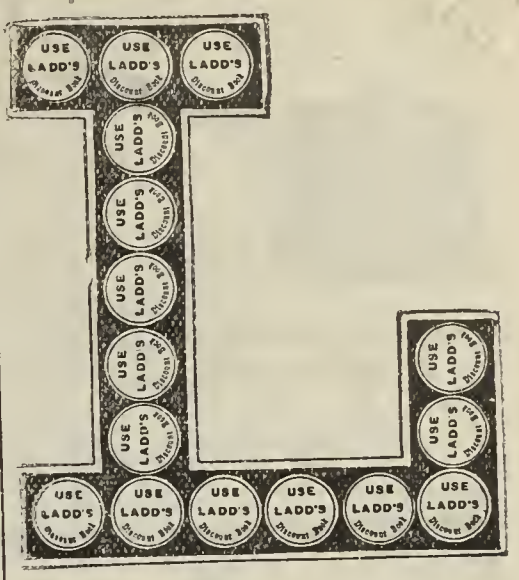
CONSTRUCTION—The Board in point of construction excels anything of its kind ever produced. Its lines present a symmetry and regularity pleasing to the eye, and in point of strength is unquestionably superior to any.

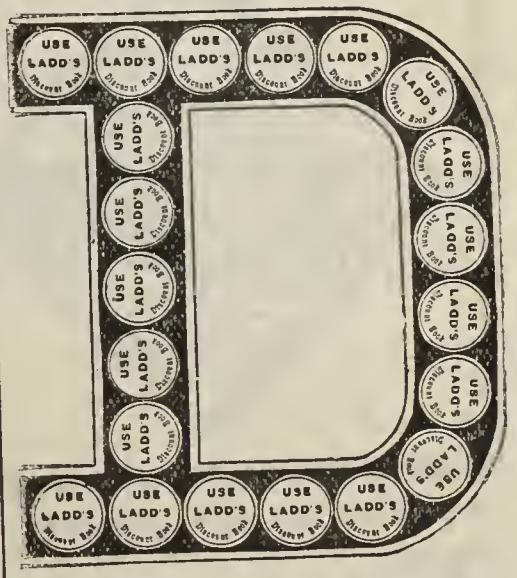
SALES—Where these are offered for sale competing boards are not "in it."

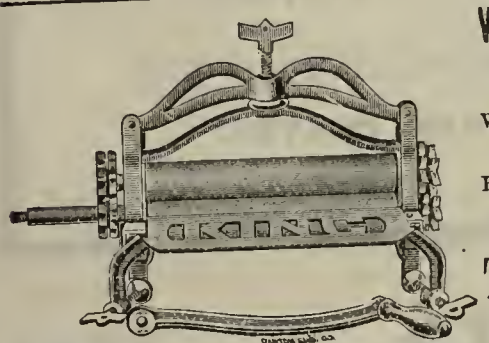
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Olds Wagon Works,

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We are Sole Manufacturers of the Celebrated Erie and King Wringers.

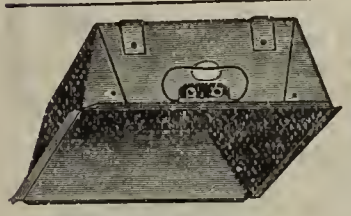
We also make all other brands of Wood and Iron Frame Wringers.

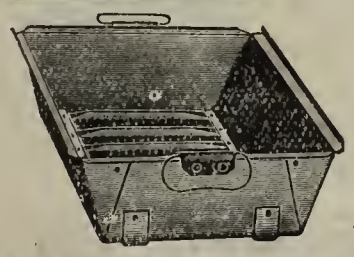
Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

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New York Office, 107 Chambers St., John T. Ryan, Mgr



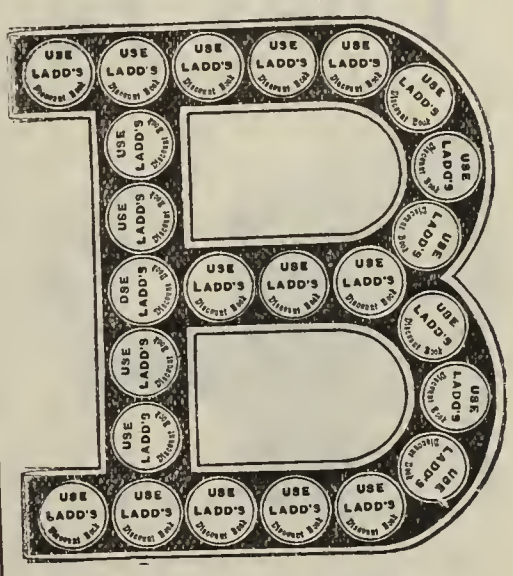


Columbia

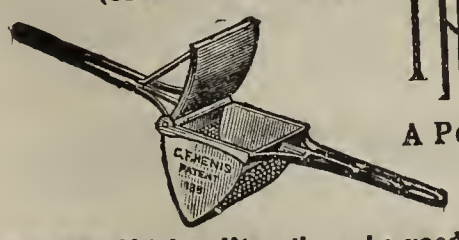
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Owing to its construction a free circulation of air is assured. No other Roaster has this feature. The best ever offered, because it produces better results than others.

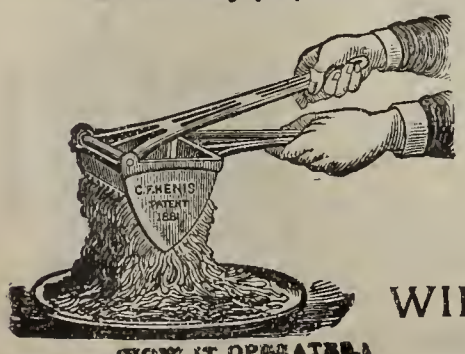
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No other Kitchen Utensil can be used for so many purposes.



(SHOW IT OPERATED.)

THE HENIS Fruit Press and Vegetable Strainer.

A Potato Masher, A Fruit Press, A Jelly Press, A Disintegrater, A Colander, and A Vegetable Strainer,

COMBINED IN ONE

Small, Strong, Light, Cheap, Handy Utensil.

ALWAYS READY. EASILY CLEANED.

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COOKERS, COFFEE POTS AND OTHER SPECIALTIES.



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"NEVER-BREAK"

Wrought Steel Spiders, Griddles, Kettles, Stew Pans, Maslins, Scotch Bowls, Etc.



Flat Bottom Kettles, Four Sizes. Polished, Tinned AND Porcelained.

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Granite Ironware and Dripping Pans.

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RANGE KETTLES and NICKEL PLATED COPPER TEA and COFFEE POTS.



THE ROME Tea Kettles are full size and weight of metal. Have seamed in spouts that cannot be melted off. Handles of one piece of wire running through the wood. These goods are the best and cheapest on the market.

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Made of IX Tin.



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Patent Pending.

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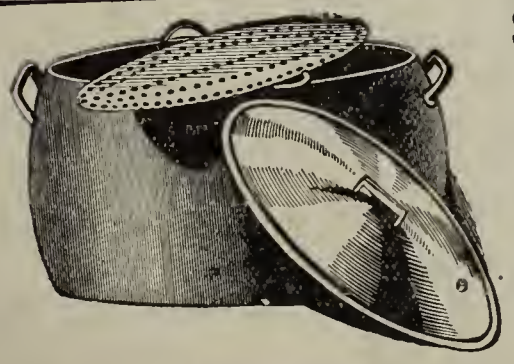
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WE MAKE the strongest, most substantial and most handsomely ornamented Flour Bin on the market. It is supplied with our patent **detachable shield,** which keeps the weight off and the crank from clogging. It also has our patented sleeve, which protects the flour from coming in contact with the iron crank. It has many other valuable features. We are daily receiving inquiries from consumers in places where our bins are not handled by dealers. You can have this trade if you want it, by carrying a small stock of our bins. With orders for one dozen or over we furnish 500 of our handsome booklets with your name and address, thus giving you some of the best free advertising you ever had. Very respectfully,

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The S. & P. ASPARAGUS AND CORN COOKER,

For Corn, Asparagus, Meats, Etc., Etc.

Blue Enamel Finish Outside. Tinned or Enameled Inside. Strainer for Lifting Out. Side Handles.

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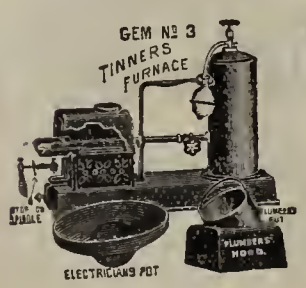
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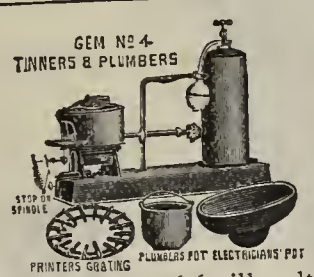
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Have Slotted Cylindrical Cast Iron Burner, shape is such that Solder Cannot Clog them.







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OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

At LOWEST PRICES EVER KNOWN.

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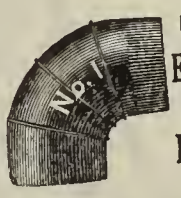
JOS. W. WAYNE,

MANUFACTURER,

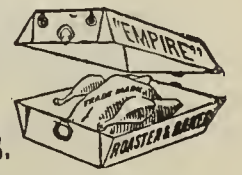
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Makers of Elbows AND Roasters.



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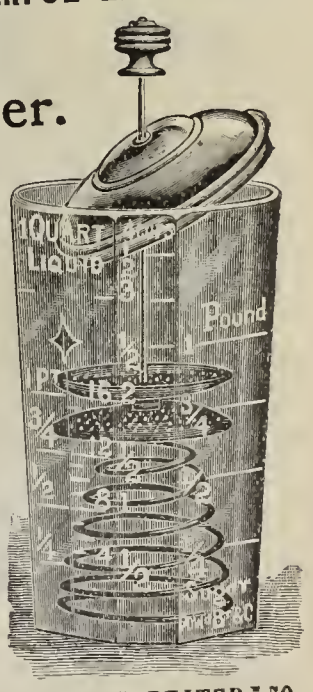
Perfect beating in 1 minute.

A combined dry and liquid measurer.

The cheapest and neatest of 'em all.

Once tried always used.

2 sizes.



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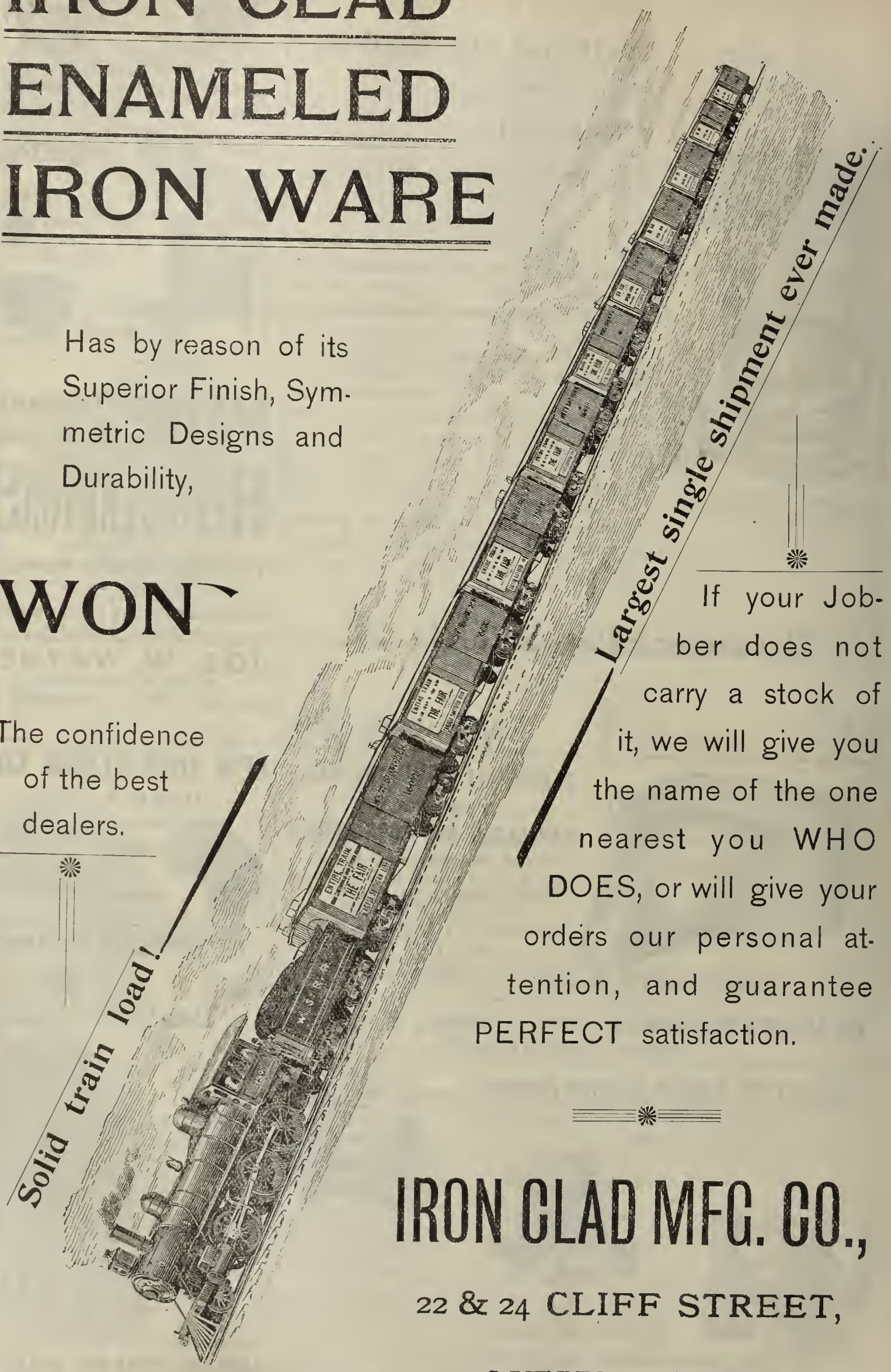
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IRON CLAD ENAMELED IRON WARE

Has by reason of its Superior Finish, Symmetric Designs and Durability,

WON

The confidence of the best dealers.



If your Jobber does not carry a stock of it, we will give you the name of the one nearest you WHO DOES, or will give your orders our personal attention, and guarantee PERFECT satisfaction.

IRON CLAD MFG. CO.,

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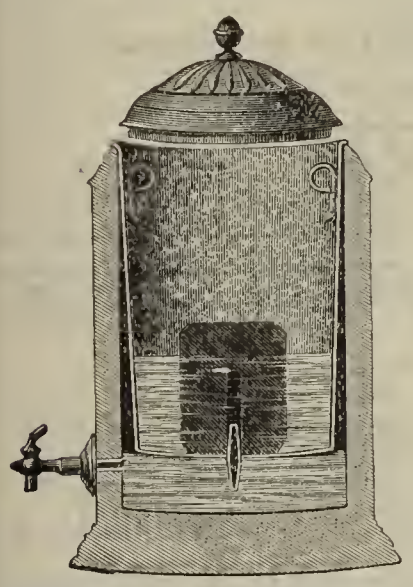
NEW YORK.

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——WITHIN REACH OF EVERY FAMILY.——

CLARIFIES AND PURIFIES THOROUGHLY—NO TASTE OR SMELL—ONLY PURE CARBONS USED—REMOVABLE FOR CLEANING.

The "CENTRAL" Filter=Cooler is an adaptation of a device long in use abroad, especially in France, Germany and England. Heretofore applied only to expensive constructions, it is now brought within reach of every household. The cooler, complete, costs but little more than the ordinary article, while the filtering device is of the very highest quality. The carbons are pure and easily detached for cleaning; the filtering cylinders are made to fit **all our regular series of Coolers.** An important feature of the Filter-Cooler is the **separation** of the **ice** from the **filtered water.**



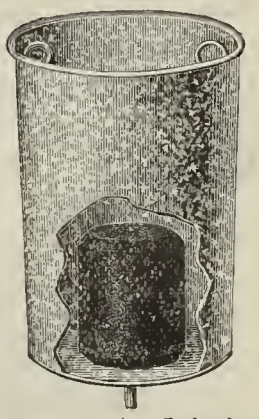
Sectional View of Cooler Showing Filter in Position.

Prices and Sizes—Cooler-Filters Complete.

GALLONS—	2	3	4	6	8	10	14
Japanned or Crystal, each,	$4.50	5.00	5.75	7.00	8.50	10.50	14.50
Extra Heavy—Japanned, with side handles, each,	$6.00	6.50	7.50	8.75	9.75	12.00	16.50

Filter Cylinders Only, Fitted with Carbons.

GALLONS—	2	3	4	6	8	10	14
Each,	$2.50	2.75	3.00	3.50	4.00	4.50	5.50

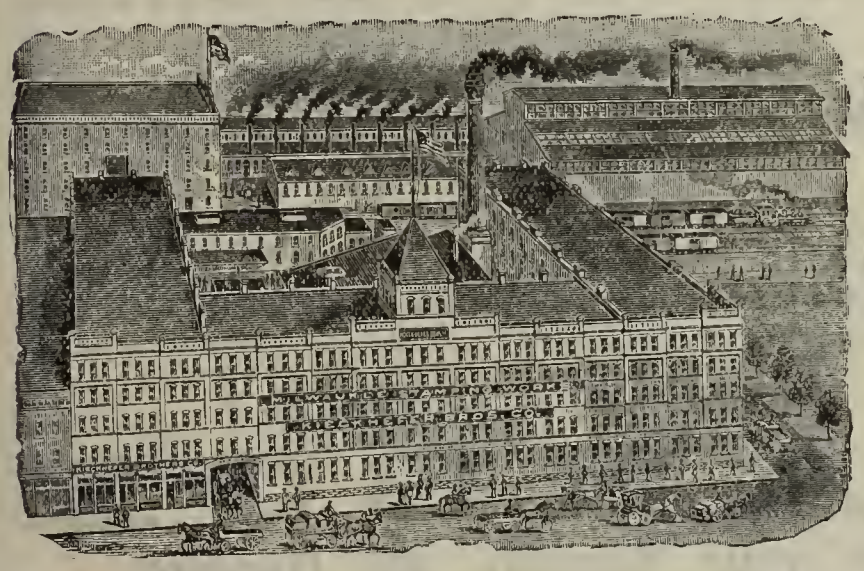


Showing Filter Detached.

THE CENTRAL STAMPING CO.,

23 and 25 CLIFF STREET, - - NEW YORK.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

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Tinware and Sheet-Iron Goods.

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IF SO,

You want our SQUEEZER.

Positively the best. Suitable for any size lemon.

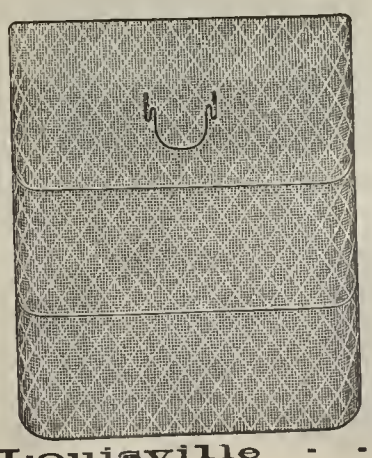
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in the country. Beautiful designs; all sizes; large stock.

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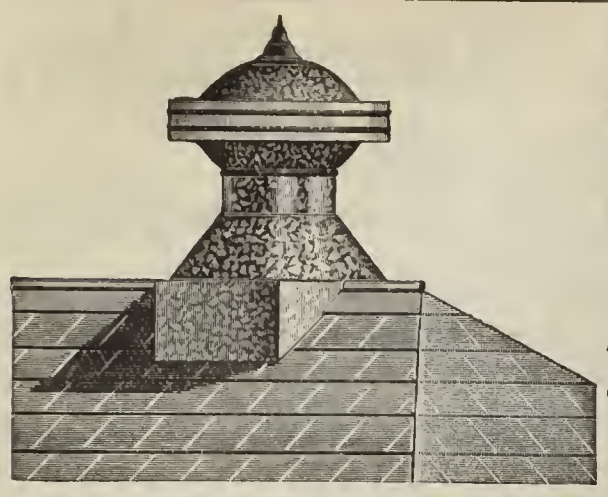
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Globe Ventilators.

They "get there" and "stay there"

Through sunshine and through storm, doing the work required of them silently, steadily, satisfactorily.

Send for Special Pamphlet on Ventilation.

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A. G. BRAUER.

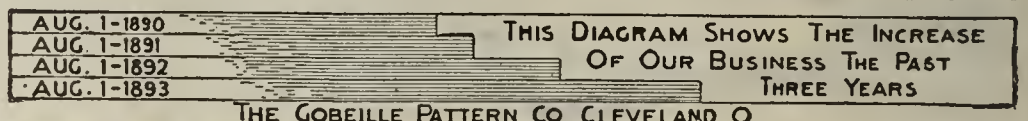
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THERE **RUTLAND LINING** WHY
IS CARRIED BY THE BEST TRADE IN
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IT FITS ANY STOVE AND IS CHEAP.
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DON'T FORGET
TARBOX
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"FIRESTONE."

A new material which makes the strongest, most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

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BELLOWS, 8, 9, 10 & 12 in.
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BRISTLE BRUSHES.
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Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

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227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

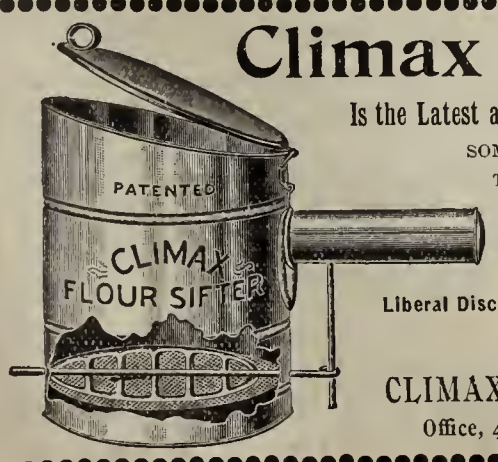
Stove Trimmings, Knobs, Hinge Pins, &c. ☞Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods.☜

The sample tells the story!

A sample of Dixon's Pure Flake Lubricating Graphite is sent free of charge with an interesting and instructive pamphlet. Every wide-awake engineer and mechanic should send for them.

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Is the Latest and Best Flour Sifter on the Market.

SOME OF ITS ADVANTAGES ARE:

That it is operated with one hand instead of two.
It is done with a natural motion of the hand.
It has a cover and does not scatter the flour.
It has an agitator that will not grind foreign substances through the wire netting.

Liberal Discounts to Wholesale Trade. Write for Prices.

Manufactured by the

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Iron Enameled Ice Cream Cans.



Do not buy Cans until you get our prices. We are Headquarters.

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Millions in use. Seamless cups, will not rust. German Silver knives; and not tin knives. Cream will not stick to sides. Sizes standard.



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V. CLAD & SONS,

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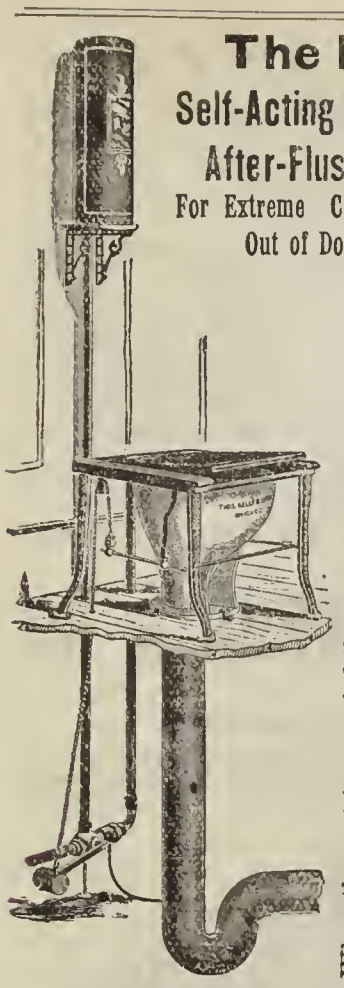
117-119 So. Eleventh St., Philadelphia.

— RIGHT IN THE SWIM.—Mrs. Highleighfe: "Have you had your monogram put on your carriage?"

Mrs. Bongtong (who is making her *début* into society): "Yes, indeed. And I had R. S. V. P. put with it, just like your lovely invitation cards."—*Chicago Record.*

— THE PROFESSOR: "Mr. Quarterback, in the equation before us what does x into 9 plus a b equal?"

Mr. Quarterback (whose thoughts have been wandering): "Er—a flying V."—*Chicago Record.*



The Kelly
Self-Acting Frost-Proof After-Flush Closet.
For Extreme Cold Places and Out of Door Work.

When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

—SEND FOR CATALOGUE.—

Thomas Kelly & Bro.,
124 Franklin St., Chicago,
Manufacturers of Permanent Plumbing Goods.



TINNERS, ATTENTION! GREAT REDUCTION IN PRICE.

Best Eave Trough Fastener in the World.
Yapp Patent Champion Fastener
MANUFACTURED BY
WALTHER & CHRISTMAN,
Successors to CHAS. BODY,
269 to 275 Central Ave., Cleveland, Ohio
Send for sample and price-list



Buy Iwan's Volcano Revolving & Ventilating Chimney Top
The best in the World
For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.
FOR SALE BY
Berger Bros., Phila., Pa.
Garry Iron & Steel Roofing Co, Cleveland, O.
Cincinnati Stamping Co., Cincinnati, O.
Illinois Roofing & Supply Co, Chicago, Ills.
IWAN BROS.
Sole Mfrs., Streator, Ills.

— VILLAINOUS — "John," said De Broot's wife, "I don't know what to do about the hired girl."

"Why don't you fire her?"

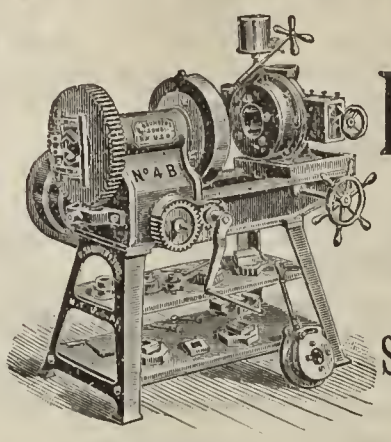
"I have. But I can't get rid of her."

"H'm'm. I'll attend to that to-morrow morning."

"How?"

"I'll get up early and show her how to light the fire with kerosene. Then we'll let nature take its course."—*Washington Star*.

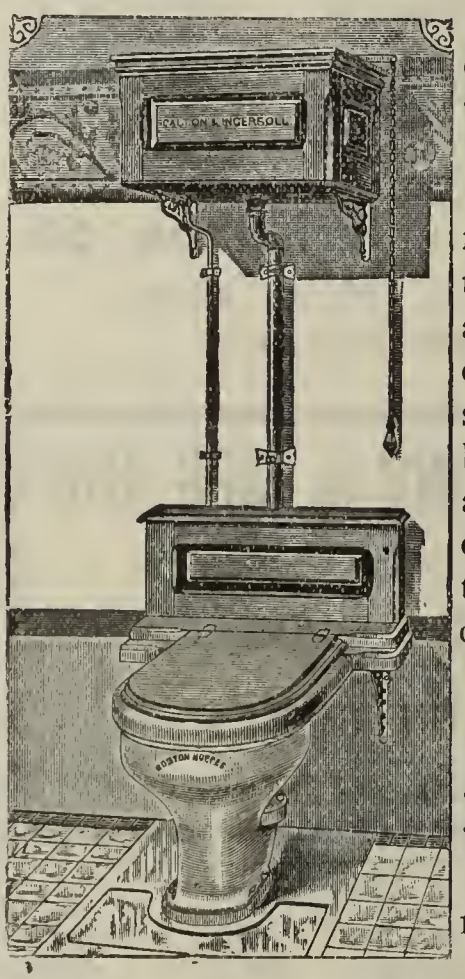
D. SAUNDERS' SONS,



MANUFACTURERS OF
PIPE Cutting AND Threading MACHINES
All sizes ¼ inch to 16 inch for Pipe Mill, Gas and Steam Fitters' use. Tapping Machines for steam-fittings, also
STEAM and GAS FITTERS' HAND TOOLS.
SEND FOR CATALOGUE.
No. 4 B Machine, ⅛ to 4 inch. Hand or Power.
No. 25 Atherton St., Yonkers, N. Y.

BOSTON HOPPER WATER CLOSET.

(TRADE-MARK.)

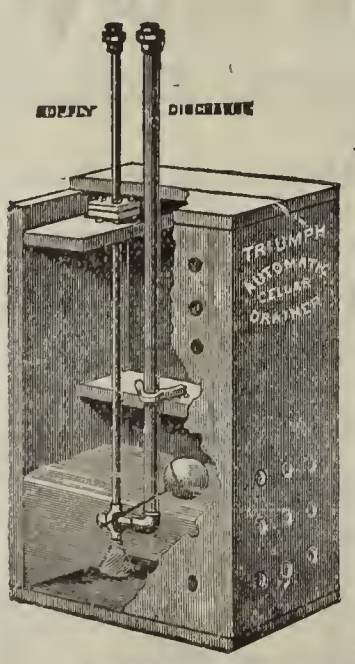


Considered the perfection of closets. It is a modification of what is known to the trade as a Short Hopper and Trap combined. Its exterior outline is in pedestal form, which gives perfect support to the bowl. This construction will allow the seat to rest directly on the closet, dispensing with the use of seat legs, if so desired, allowing a better opportunity for cleaning around the closet. This feature of construction will recommend itself to those looking for simplicity and cleanliness.

[See our advertisement next week for sectional view.]

—MANUFACTURED BY—

Dalton-Ingersoll Co.,
Wholesale Dealers in Plumbers' Supplies,
171, 173 & 175 High St. (Fort Hill Square).
55, 57 & 59 Purchase St., Boston, Mass.



A SURE CURE
—FOR—
WET CELLARS.

The Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

FRIEDENWALD BROS.,
216 N. Holliday St., Baltimore, Md., Sole Mfrs.
Pat. May 19, '85. Pat. May 26 '85. Pat. July 14, '85. Pat. Aug. 8, '86. Pat. Nov. 23, '86.

Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

1

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

A sample **One-inch "Skeleton" Pipe Die,** either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you **62 cents,** and will be sent upon receipt of a Postal note for that amount.

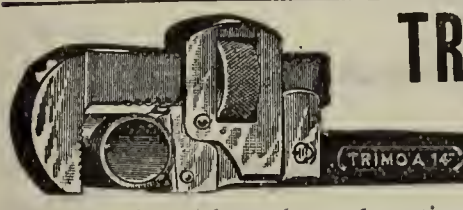
DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

HENRY B. PANCOAST & CO.,

243-245 South Third St., Philadelphia, U. S. A.

ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.



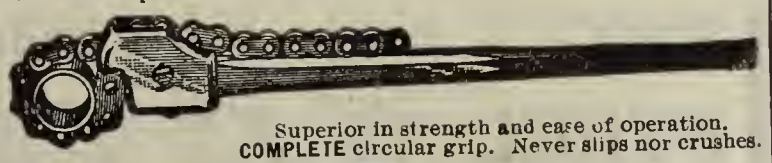
TRIMO PIPE WRENCH,

Forged Steel.

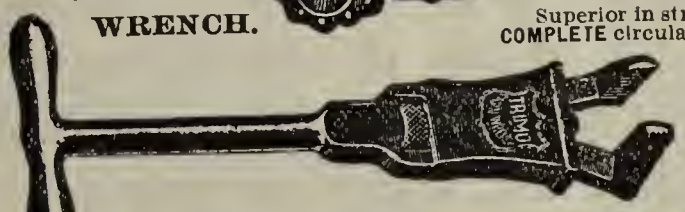
All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

TRIMO CHAIN PIPE WRENCH.



Superior in strength and ease of operation. COMPLETE circular grip. Never slips nor crushes.



Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.

TRIMO BASIN WRENCH.

TRIMONT MFG. CO., ROXBURY MASS.

The "Boyd" Basin.



Made in Ivory Body and all styles of Decoration.

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HAVE YOU SEEN IT?
IF NOT, GET POSTED.

We Will Post You.

PECK BROS. & CO.,

Fine Sanitary Goods,

47 Cliff St., NEW YORK; 127 Chestnut St., NEW HAVEN, CONN.; 259 Wabash Av., CHICAGO.; 65 Oliver St., BOSTON.

BROUGHTON SELF-CLOSING

COCKS.

EVERY ONE WARRANTED.



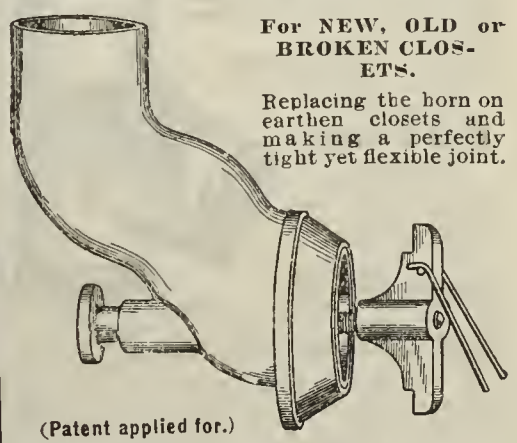
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E. STEBBINS MF'G CO., Sole Manufacturers.

BRIGHTWOOD, MASS.

SAVILL'S PATENT

CLOSET : CONNECTION



For NEW, OLD or BROKEN CLOSETS.

Replacing the horn on earthen closets and making a perfectly tight yet flexible joint.

(Patent applied for.)

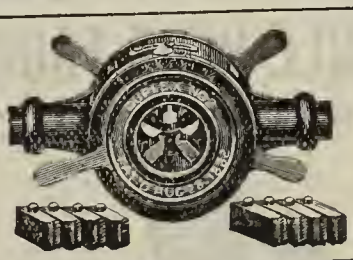
For Lead and Iron Pipe, in Bent and Straight Styles.

Send for Prices.

SAVILL, WALLS & CO.,

Mfrs. of Plumbers' Supplies,

229 Budden Street, - - - PHILADELPHIA, PA.



DUPLEX

DIE STOCK.

COSTS MORE BUT!

Lasts a lifetime and doesn't require strength of a giant TO WORK IT.

THE HART MFG. CO., - CLEVELAND, O.

LEATHER AND RUBBER

WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

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— A GOOD BOOKKEEPER.—"Jaggles is a good bookkeeper," said one to another.

"How do you know?"

"I lent him a book once."—*Washington Star.*



The Climax Ratchet Stock

Is an indispensable tool for conveniently threading iron pipe in ditches, under floors, in corners, over head, etc. With this tool threads can be cut without removing whole lengths of pipe. This tool is provided with a strong vise which securely grips the pipe, and by means of the leading thread the die is forced on pipe and the thread is cut. It is made of malleable iron and steel, and while light in weight, making it convenient to carry, is very strong and rigid. The advantages of this tool make it absolutely indispensable to Plumbers, Steam and Gas Pipe Fitters, Gas and Water Companies, Machinists, etc. It takes standard size dies, which are extra if furnished.

No. 1 threads ¼ to 1 in. pipe, takes 2 or 2½ in. die, $10.00

No. 2 threads 1¼ to 2 in. pipe, takes 4 in. die, 17.00

For sale by leading jobbers.

Manufactured Solely By

C. M. KEMP MFG. CO.,

Baltimore.

THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.

It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them.



COONEY, SEINER & CO.,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

3-inch sample, by mail, 40 cts. in stamps.
4-inch do., 60 cts.

The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

SARGENT, GREENLEAF & BROOKS, Chicago; HIBBARD, SPENCER, BARTLETT & Co., Chicago; CANTON STEEL ROOFING Co., Canton, O.; BERGER MFG. Co., Canton, O.; ACME ROOFING Co., Canton, O.; NILES MFG. Co., Niles, O.; GARRY IRON & STEEL ROOFING Co., Cleveland, O.; JULIAN & SONS, San Diego, Cal.; BIDDLE PURCHASING AGENCY, Pittsburgh, Pa.; BRUCE & COOK, New York City; E. Y. PHILLIPS, New York City; TROY STAMPING WORKS, Troy, N. Y.; BRADFORD KENNEDY & SONS Syracuse, N. Y.; ROBERT MCCARTHY & SON, Syracuse N. Y.; HAMILTON & MATTHEWS, Rochester, N. Y.; BERGER BROS., Philadelphia, Pa.; C. S. MERSICK & Co. New Haven, Conn.; THE E. S. WHEELER & Co., New Haven, Conn.; WYETH HARDWARE & MFG. Co., St Joseph. Mo.

CLARK'S
ANGLE PLUG FAUCET

For Family Oil Cans, Etc.

(Patent applied for.)

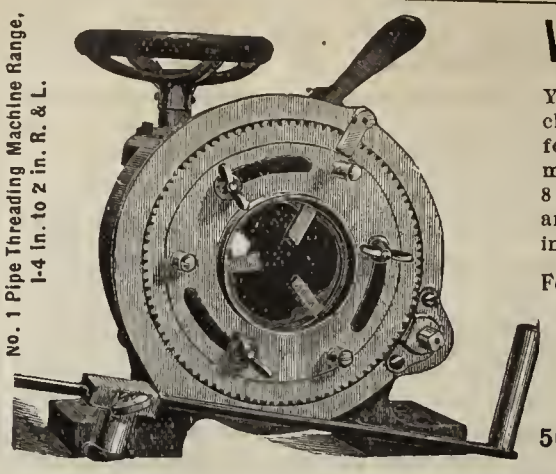


The Faucet is constructed with a Plug set on an angle, making it very convenient, and has a double running thread. The liquid has a direct flow, which obviates oozing out through the threads; in fact, the objectionable points with other styles are overcome.

MANUFACTURED ONLY BY

THE CLARK NOVELTY CO.,

ROCHESTER, N. Y.



No. 1 Pipe Threading Machine Range, 1-4 in. to 2 in. R. & L.

When Business is Dull

You should buy time and labor saving machinery. We manufacture such machinery for cutting and threading pipe. Portable hand machines enabling one man to cut and thread 8 inch pipe. Power machines take less space and power and are the simplest and cheapest in the market. Send for catalogue.

Forbes Patent Die Stock, Pipe Cutting and Threading Machinery. Pipe and Bolt Threading Lathe Attachment.

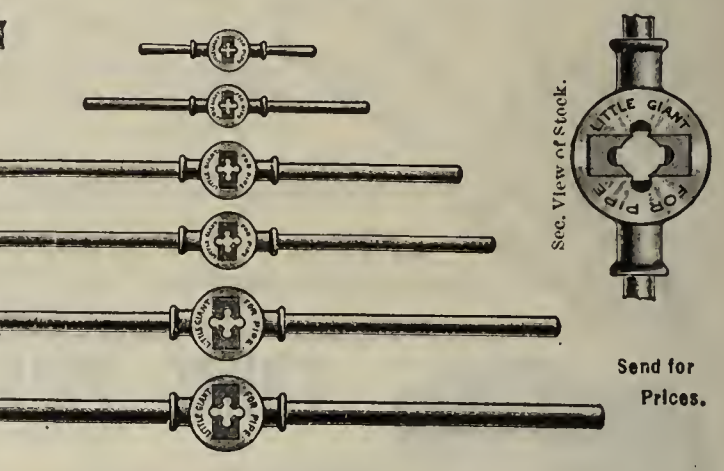
CURTIS & CURTIS,

56 Garden Street, - Bridgeport, Conn.

PIPE PLATES WITH STOCK, DIE AND GUIDE FOR EACH SIZE.



Sec. view of Stock, Die, and Guide.



Sec. View of Stock.

The Latest Thing Out.

Send for Prices.

MANUFACTURED BY **WELLS BROS. & CO.** GREENFIELD MASS.

THE STEEL CLAD BATH

is an indestructible, graceful steel shell lined with heavy tinned and planished copper. It cannot warp, rust, or collect dirt, and is an open sanitary fixture at a moderate cost. Enameling and decorations to match the bathroom.

FOR SALE BY ALL JOBBERS.

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Steel Clad Bath Co. of New York,

447 to 453 W. 26th St., New York City.

W. C. TRAGESER, President.

Western Buyers Address,

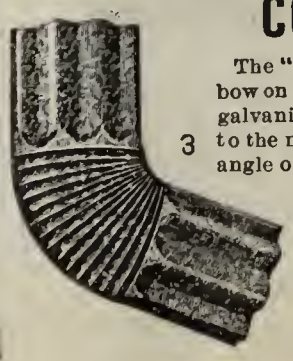
Steel Bath Mfg. Co.

Detroit, Mich.,

GEORGE BOOTH, President.

The "O. H." One Piece CONDUCTOR ELBOWS.

PLAIN, ROUND and CORRUGATED



3

The "O. H." is the strongest and most durable elbow on the market. Made of the best steel plate and galvanized after formation. Prompt attention given to the manufacturing of special elbows of any size, angle or material. Write for prices.

For Sale by all Jobbers of Tinners' Supplies.



SHOE

THE LAWRENCE-LETTS ELBOW CO., Ltd.,

MANUFACTURERS,

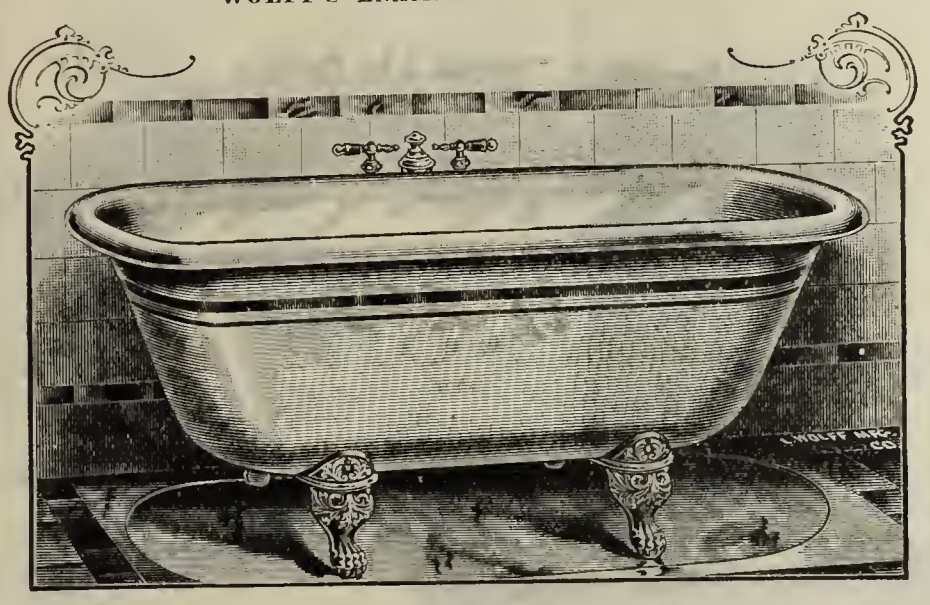
(P. O.) WAVERLY, N. Y.

L. WOLFF MFG. CO.,

PLUMBING GOODS.

GENERAL OFFICES, 93 West Lake Street, Chicago.

WOLFF'S ENAMELED IRON BATHS.



B–63.

Samples of our make Enameled Goods may be seen at our

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THE HOWELL PATENT



SHOWING SAFETY SPRING.

Rain Water CUT-OFF.

For turning the water into or off the cistern.

G. W. Howell, Mfr., Covington, Ky.



SHELL REMOVED. SHOWING VALVE

PLUMBERS' SLATE.

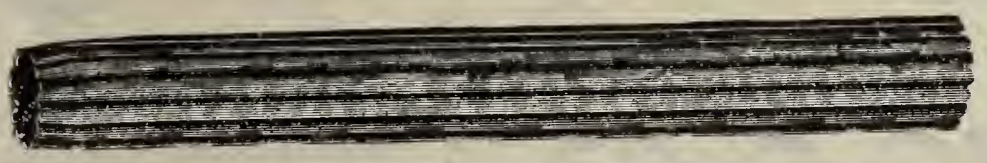
Fairhaven Marble & Marbleized Slate Co.,

FAIRHAVEN, VERMONT.

Urinal Stalls, Laundry Tubs, Sinks, Closet Slabs, Basin Slabs, Floor Slate, Building Slate.

Slate in all Forms also Slate Mantels.

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10 FT. LONG, NO CROSS SEAM.

CORRUGATED CONDUCTOR,

Round or Square. Standard Designs and Sizes. Stamped Elbows and Shoes.

Our make of Conductor is of superior quality, made on new machinery especially designed for the purpose

WRITE US FOR PRICES.

Detroit Conductor Pipe Co.,

West Larned St., Detroit, Mich.

PRACTICAL HINTS

—ON—

JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

43 PAGES. PAPER, 25c.

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

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Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

The pamphlet, in short, gives all the assistance that description of the work can furnish and is the most practical and complete account of joint wiping that has been published.

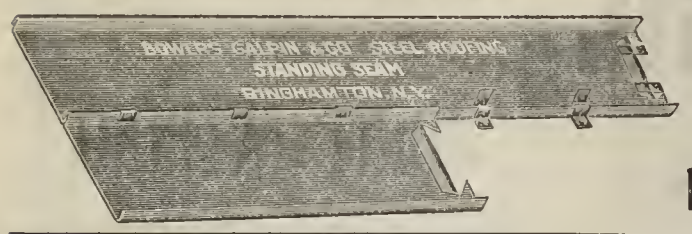
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BOWERS, GALPIN & CO.



Standing Seam and Roll Roofing.
Painted Steel, Terne and Galvanized.

—MANUFACTURED BY—

BOWERS, GALPIN & CO., Binghamton, N. Y.



DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.

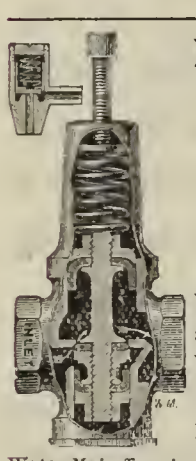
The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discounts

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THE DAY MFG. CO.,

Detroit, Mich., U. S. A.



MUELLER WATER PRESSURE REGULATOR

Will reduce and maintain a low, even pressure. Will save expense by preventing the bursting of pipes.

Water Main Tapping Machines,
Gas Main Tapping Machines,
Stop and Stop and Waste Cocks,
Corporation Stop Cocks,
Water Pressure Regulators,
Hopper Cocks, Basin Clamps,
Brass Water Connections, etc.

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COLWELL LEAD COMPANY,

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Lead Pipe, Sheet Lead, Shot,

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IMPROVED SANITARY WATER CLOSETS.

Wrough Iron Pipe of all sizes cut to order



Principles and Practice of Plumbing.

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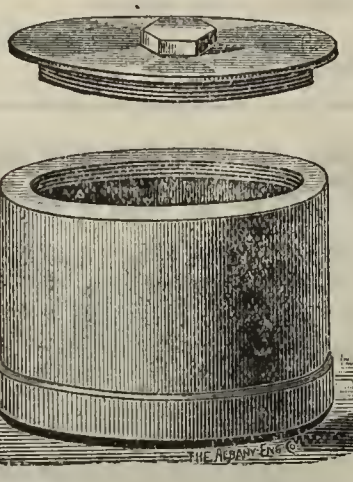
For Finding Leaks in

SOIL PIPE.

Price $15.00. Write for Circular.

Bailey-Farrell Mfg. Co.,

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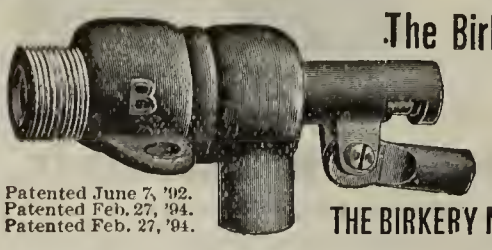
A Common Sense Trap Screw Ferrule.

The body is of cast iron in regular pipe sizes, fitting the Hub neatly and making a good wall to calk against. The **COVER** being of **BRASS** cannot unite with the iron and corrosion is prevented by the use of Graphite. A Common Sense Article at half the cost of brass.

THOMAS HYDE,

69 Perry St., ALBANY, N. Y.

FOR SALE BY ALL DEALERS.



The Birkery High Pressure Ball Cock

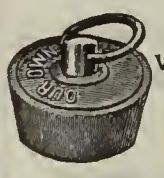
Is the Best, Cheapest and most Perfect Working Ball Cock ever offered to the public.

It will not Sing or Hammer.

For sale by dealers in Plumbers' Supplies.

Patented June 7, '92.
Patented Feb. 27, '94.
Patented Feb. 27, '94.

THE BIRKERY MFG. CO., Sole Manufacturers, **HARTFORD, CONN.**



"OUR OWN" BASIN PLUGS

With Nickel Trimmings are the Neatest and Best

SAMPLE DOZEN ASSORTED $1.

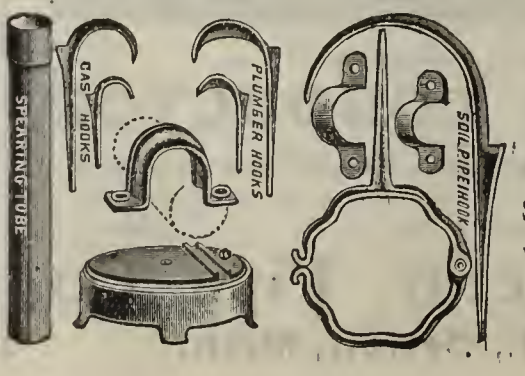


H. O. CANFIELD,

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MOULDED RUBBER GOODS,

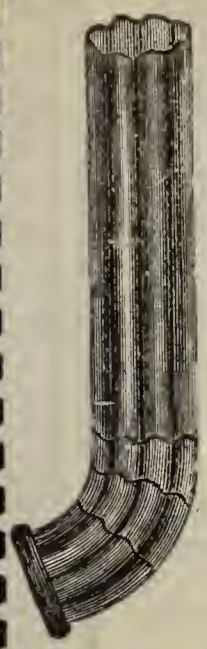
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AN immense stock of wrought patented steel and malleable Pipe Straps, Hooks and Clamps on hand; also Valves and Plungers, Ventilators, Speaking Tubes, Sheet Iron and Registers.

Write for our Latest Prices and Illustrated Catalogue, just out.

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POPULAR BECAUSE RELIABLE.

The "Austin" Corrugated

EXPANDING CONDUCTOR OR LEADER.

The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



W. AUSTIN OBDYKE & CO.,

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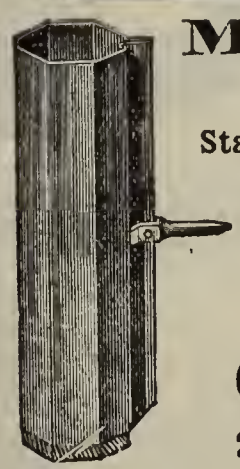
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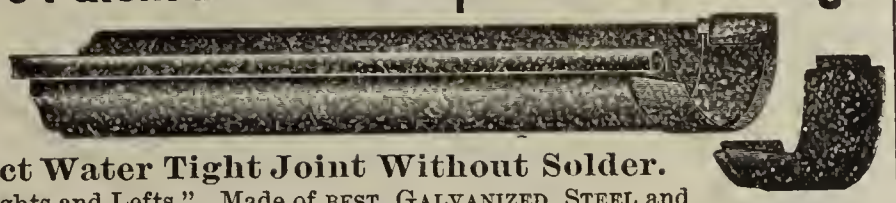
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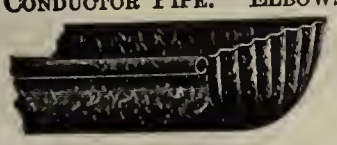
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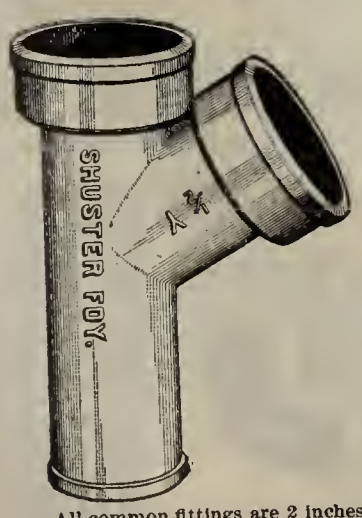
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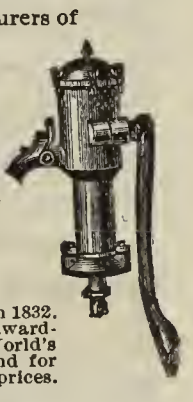
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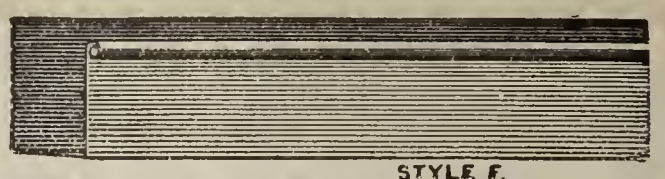
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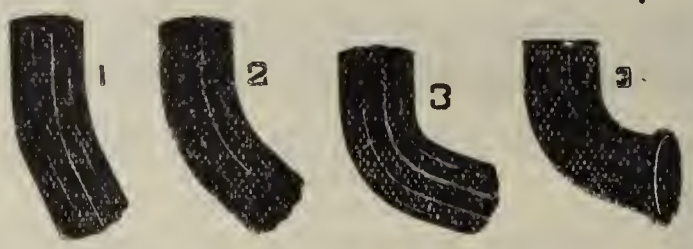
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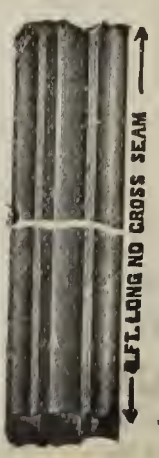
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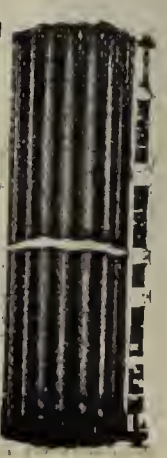
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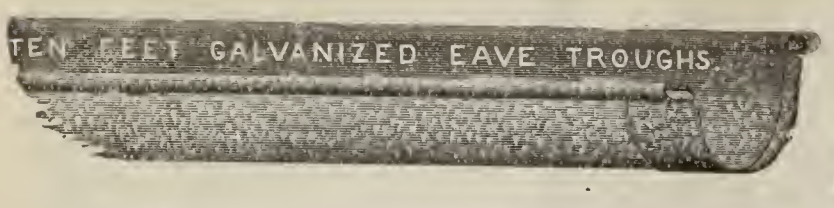
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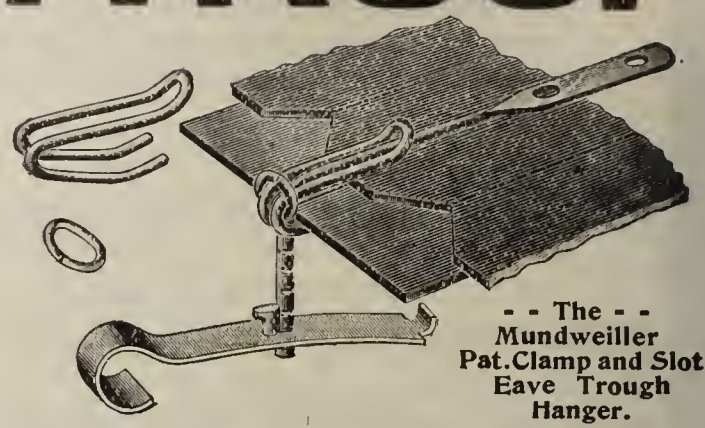
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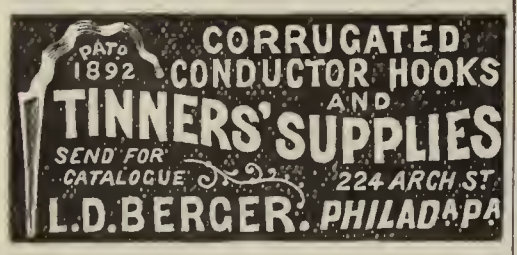
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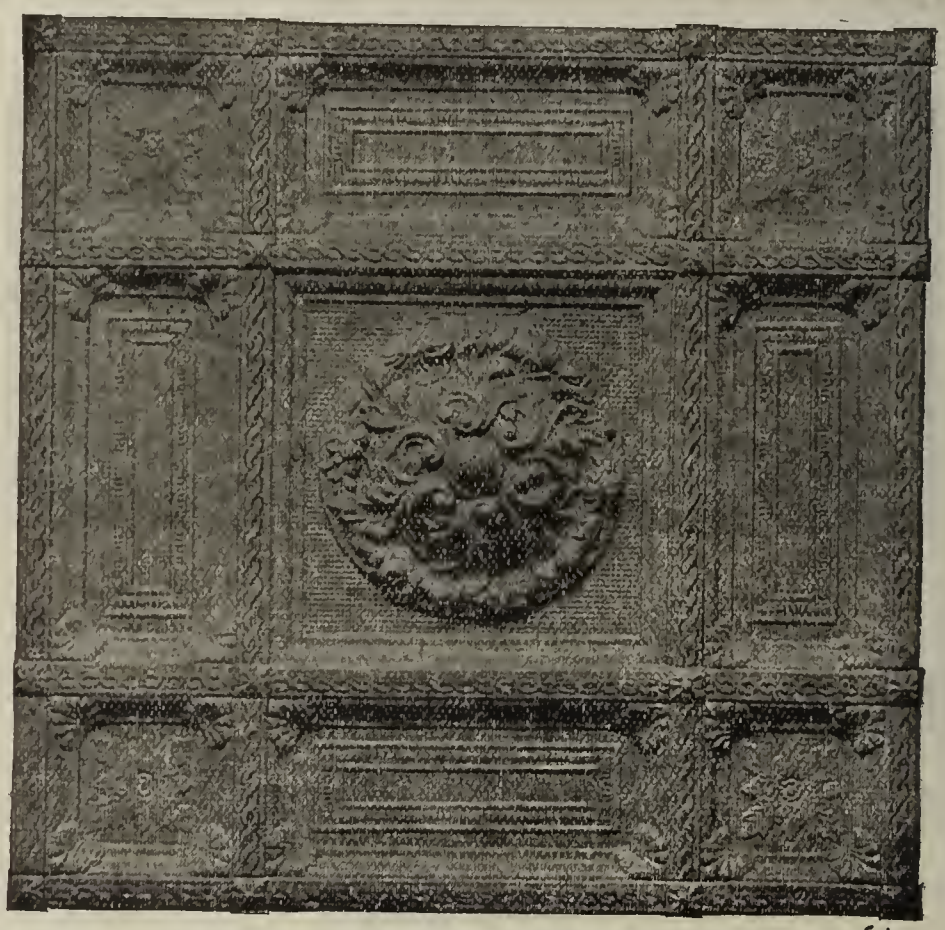
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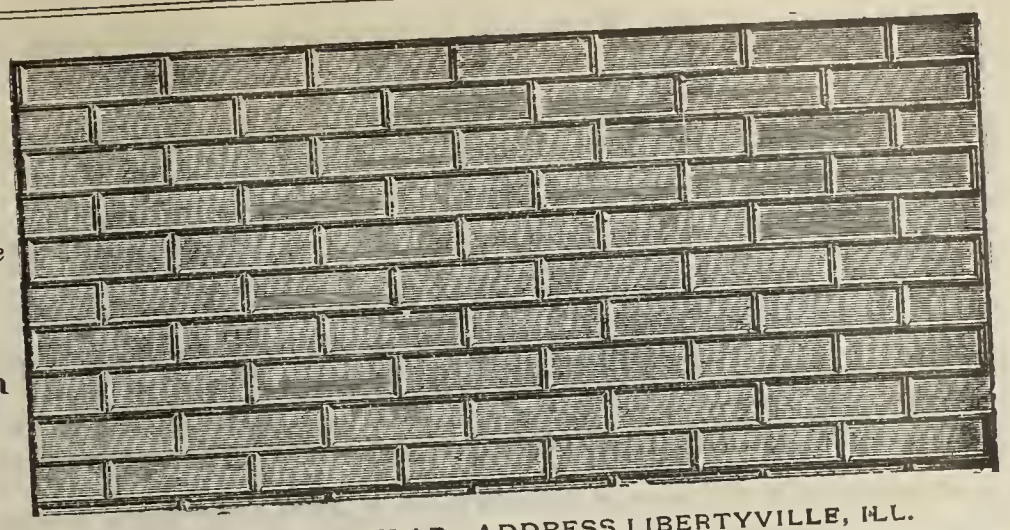
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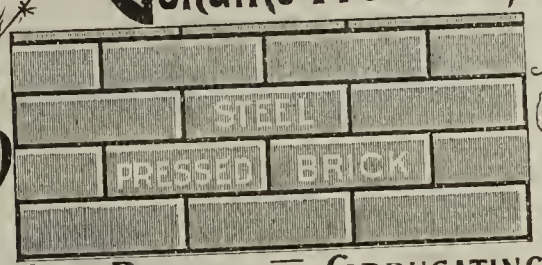
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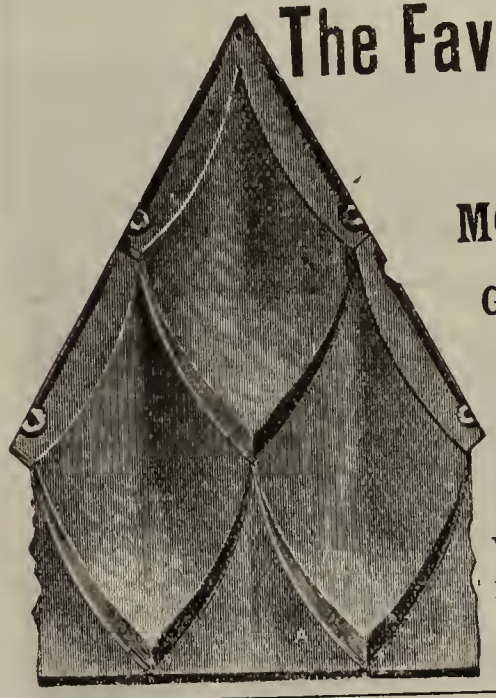
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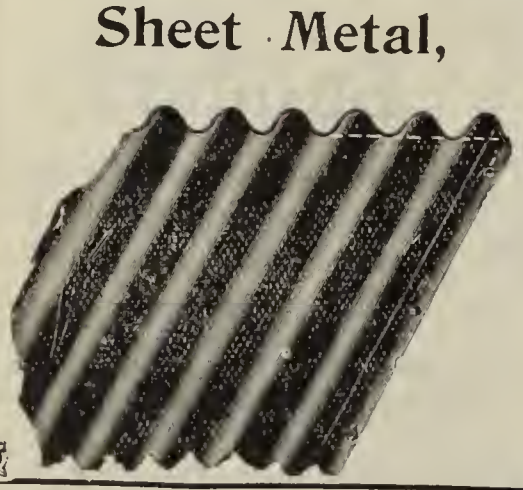
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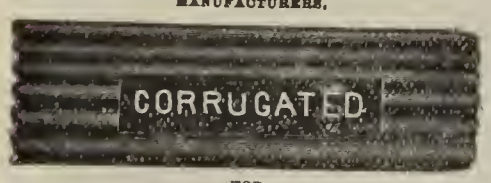


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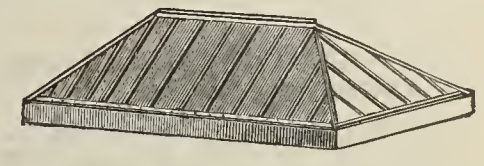
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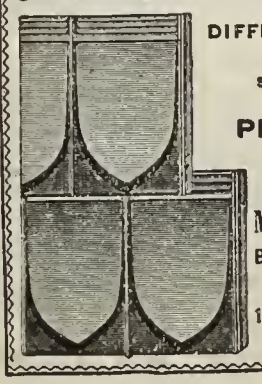
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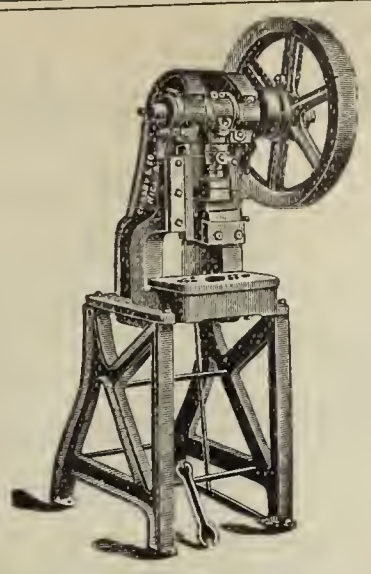
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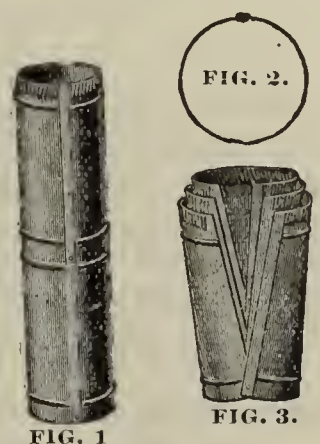


Fig. 1. Represents pipe set up and is perfectly smoke tight.
Fig. 2. Represents an end view of pipe and shows construction of seam.
Fig. 3. Represents top of joints spread and packed for shop or domestic use.
Fig. 4. Represents pipe packed for shipment. It is rolled in paper and is shipped at 4th class freight rate and in car lots at 5th class.

FIG. 1

FIG. 3.

FIG. 4.

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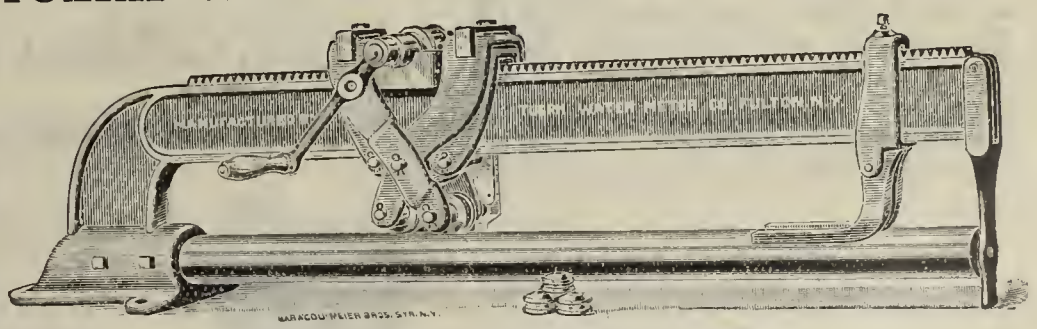
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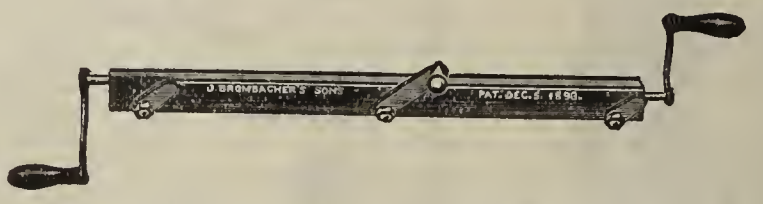
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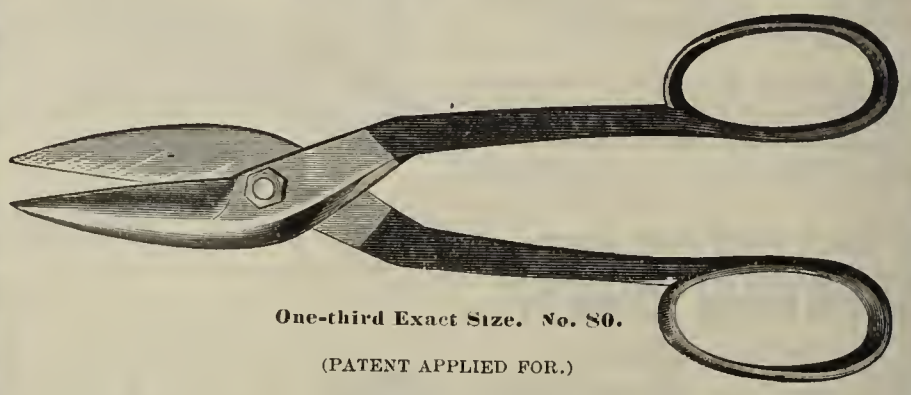
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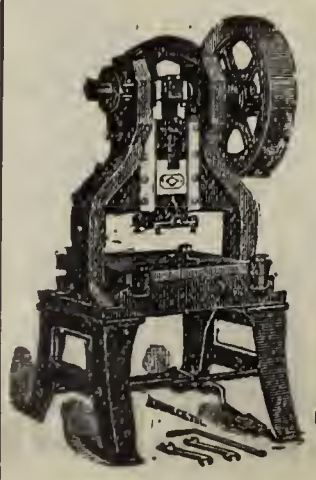
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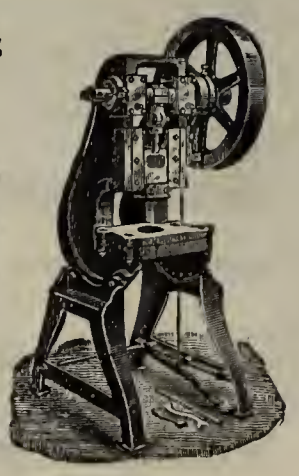
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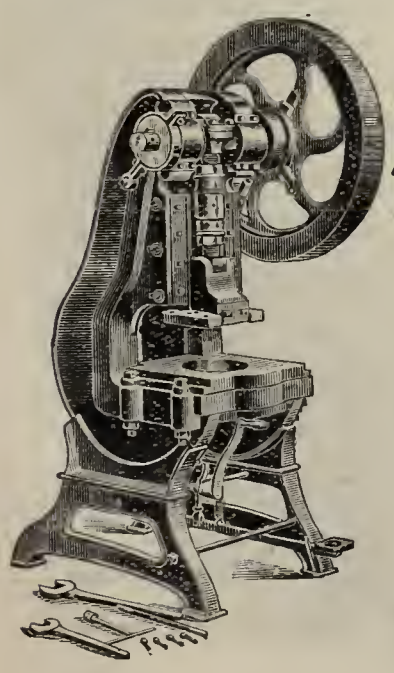
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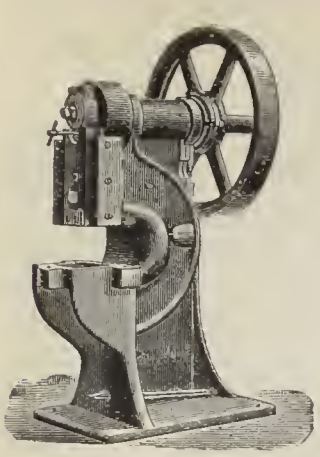
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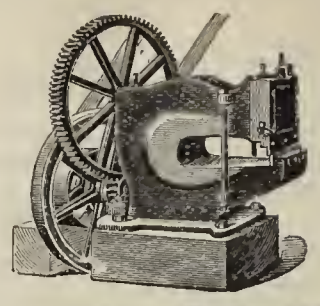
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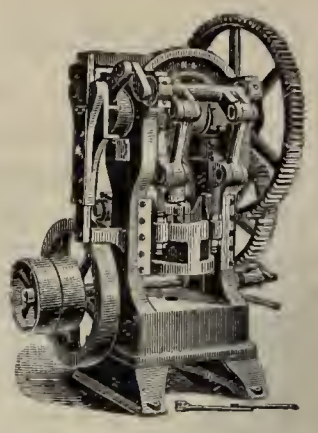
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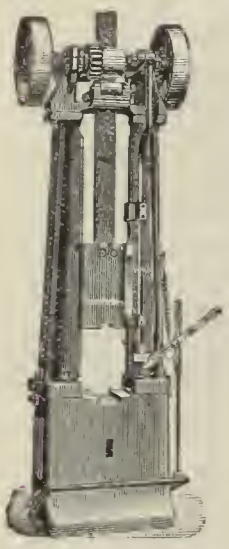


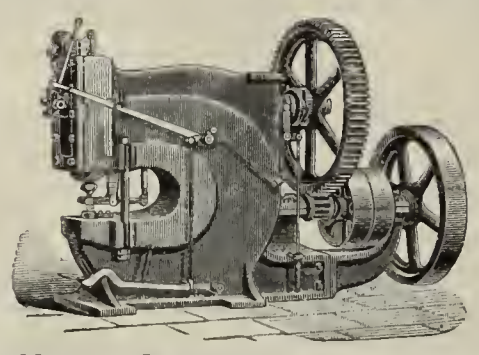
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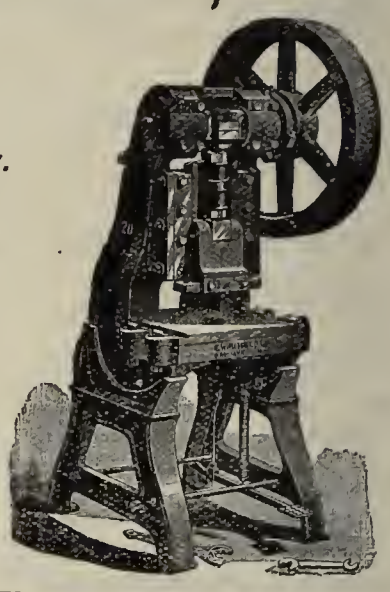
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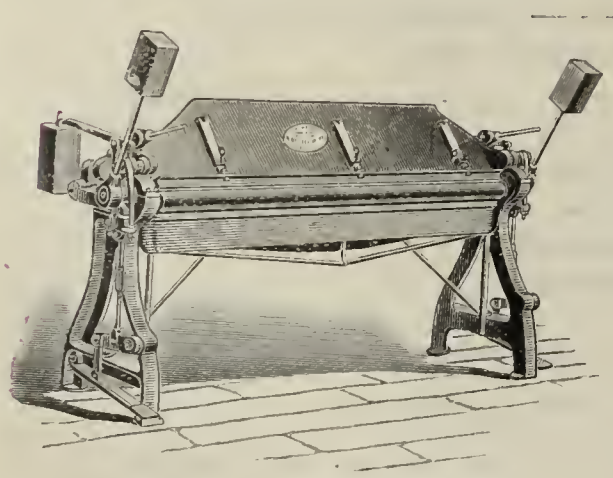


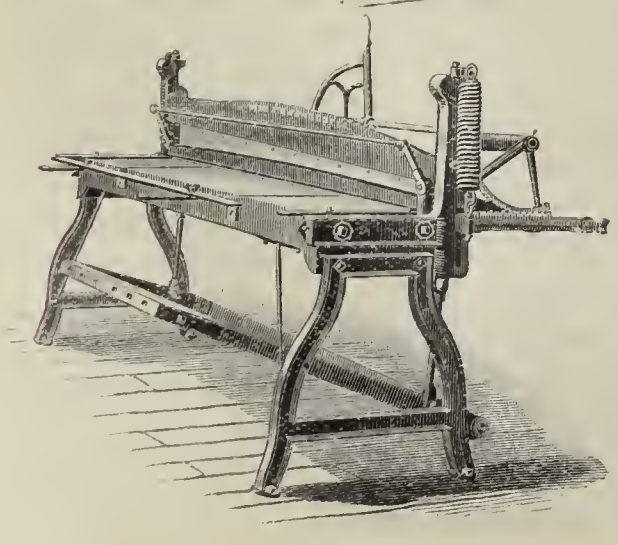
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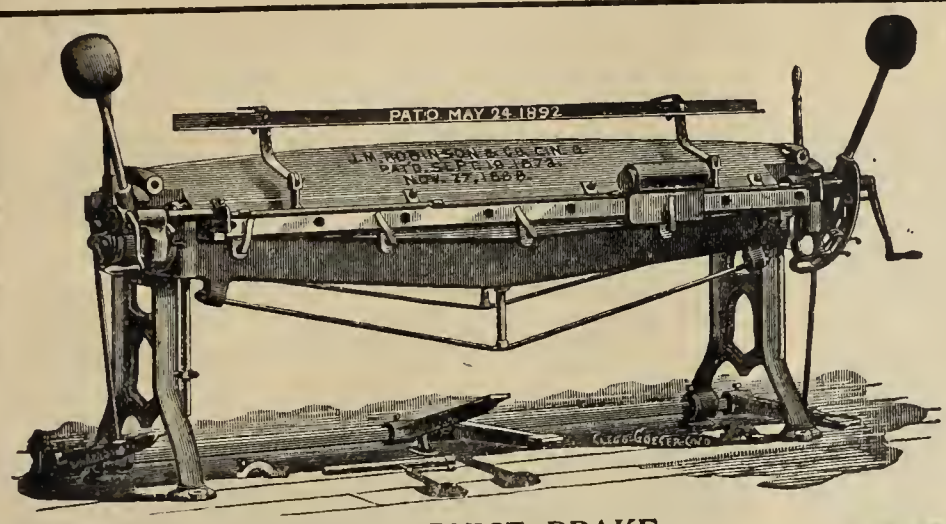
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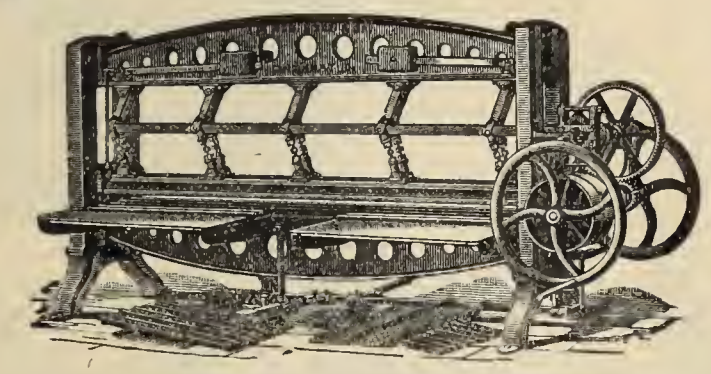


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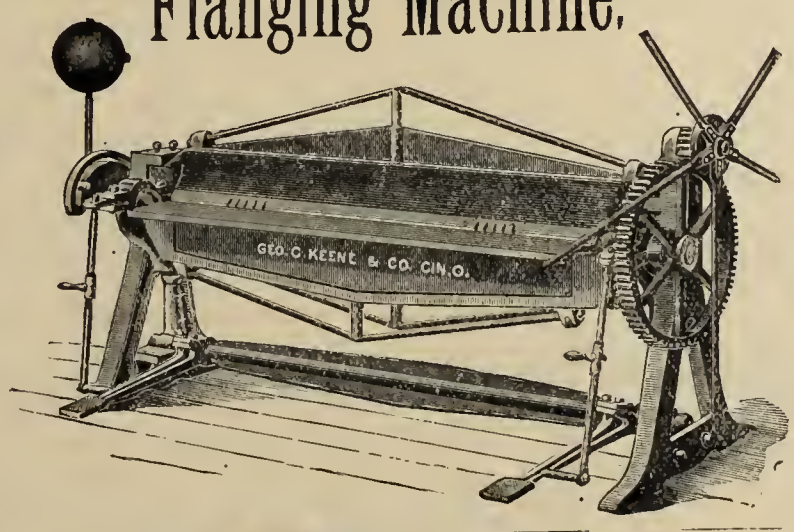
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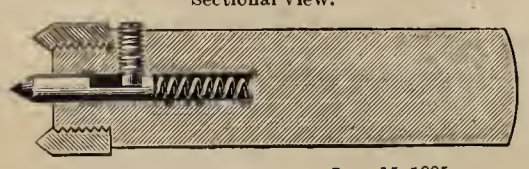
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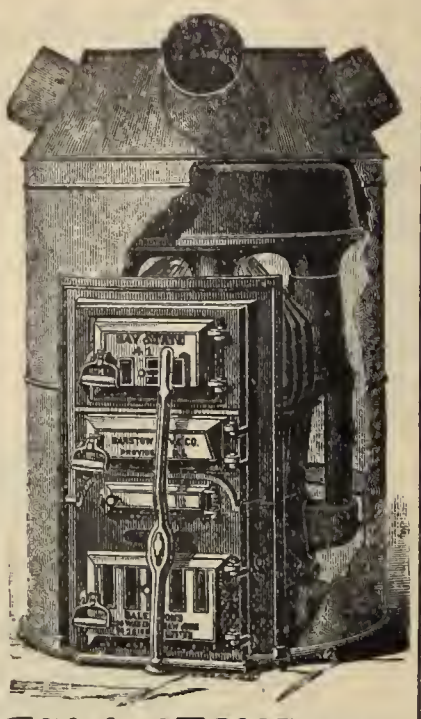
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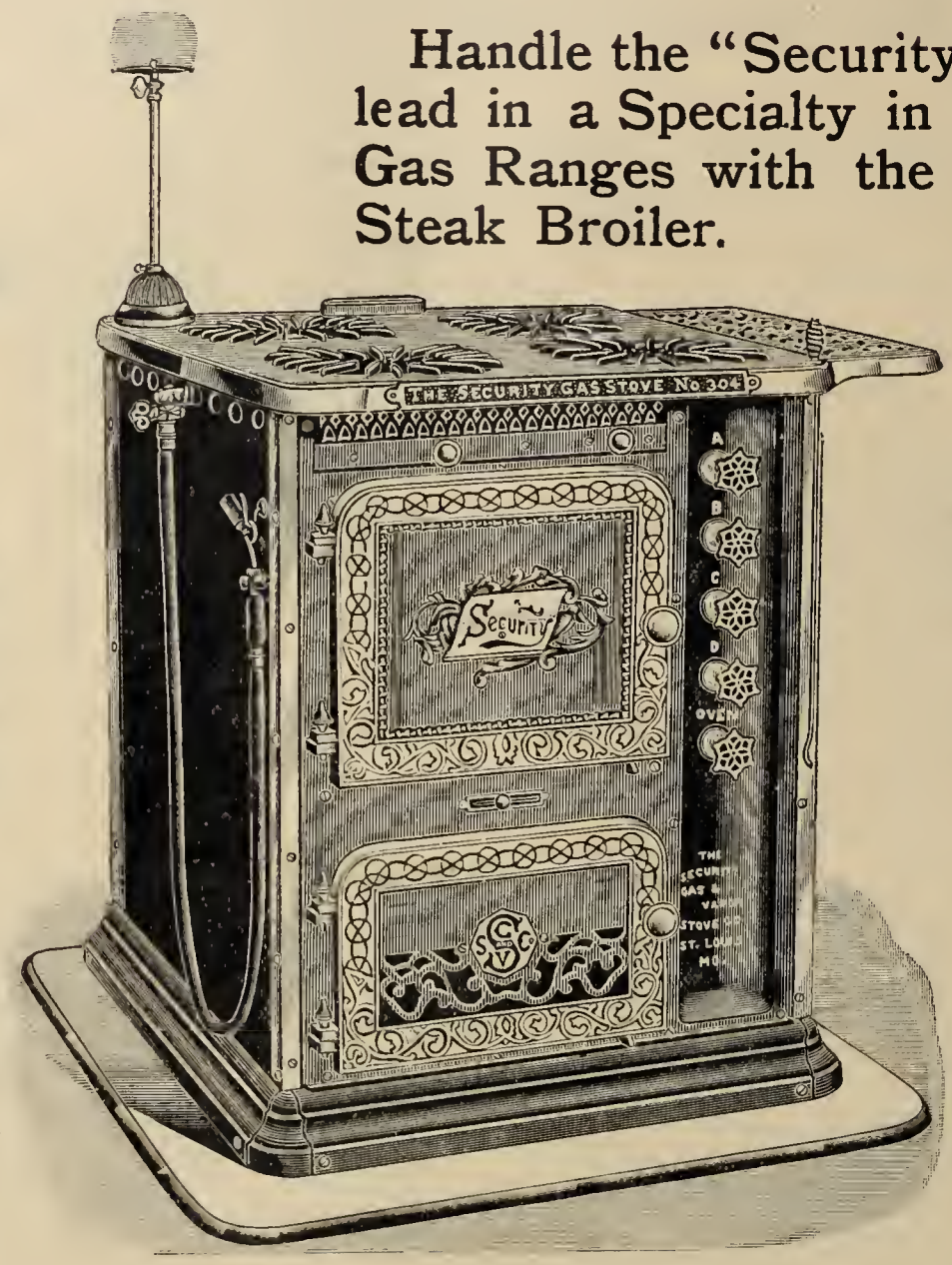
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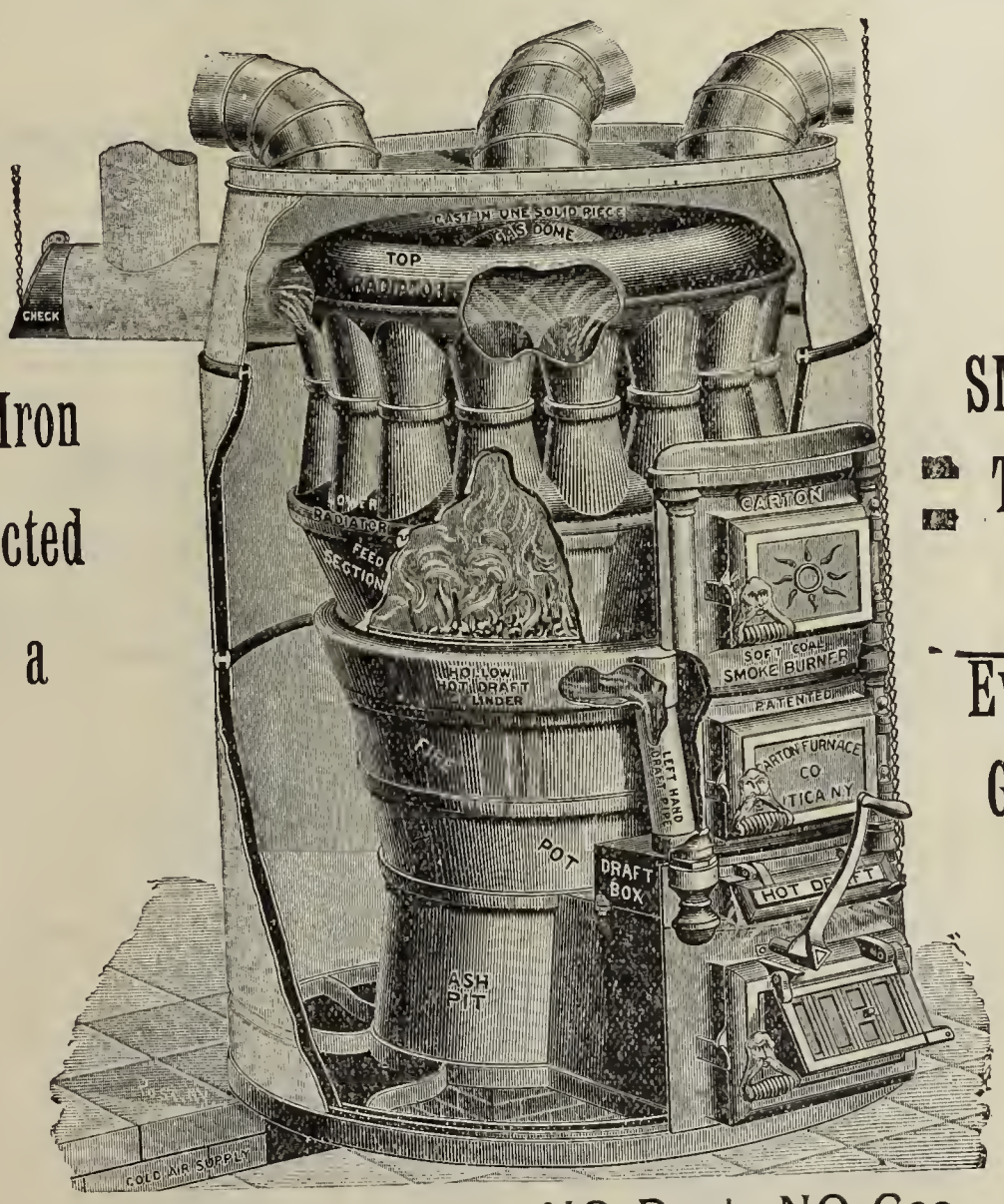
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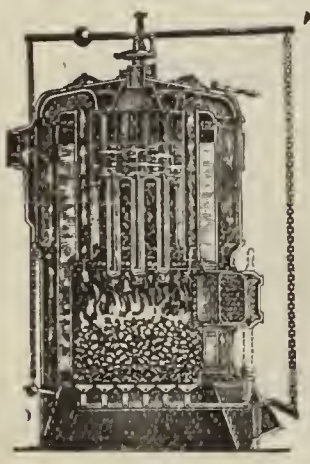
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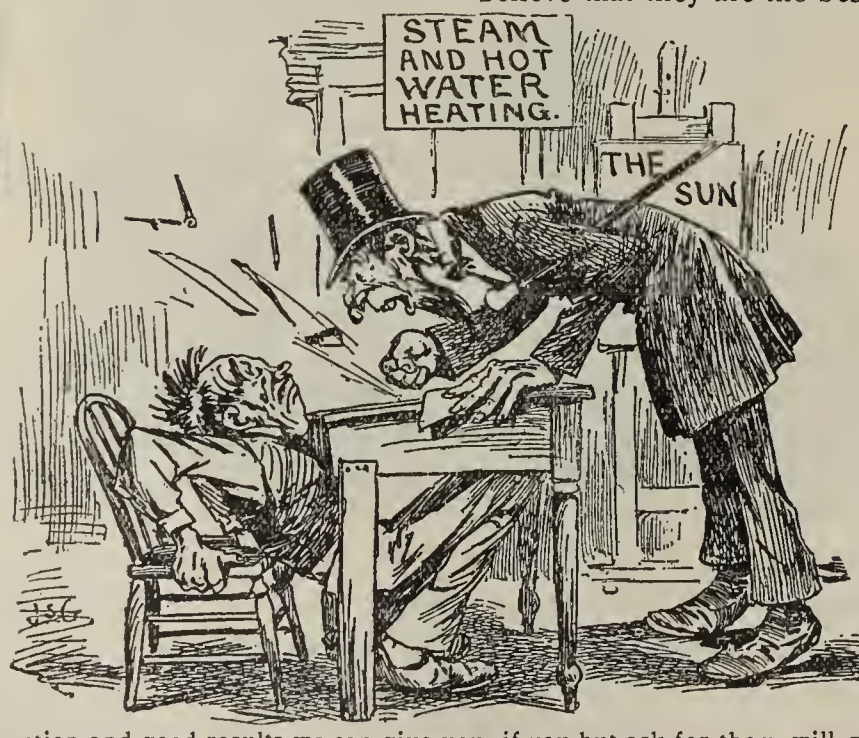
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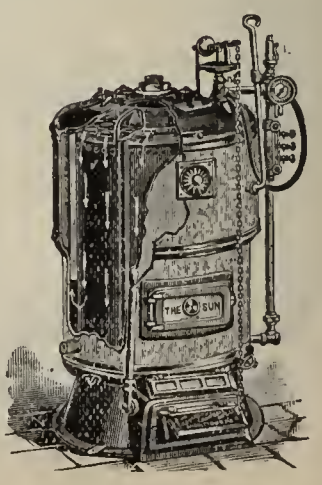


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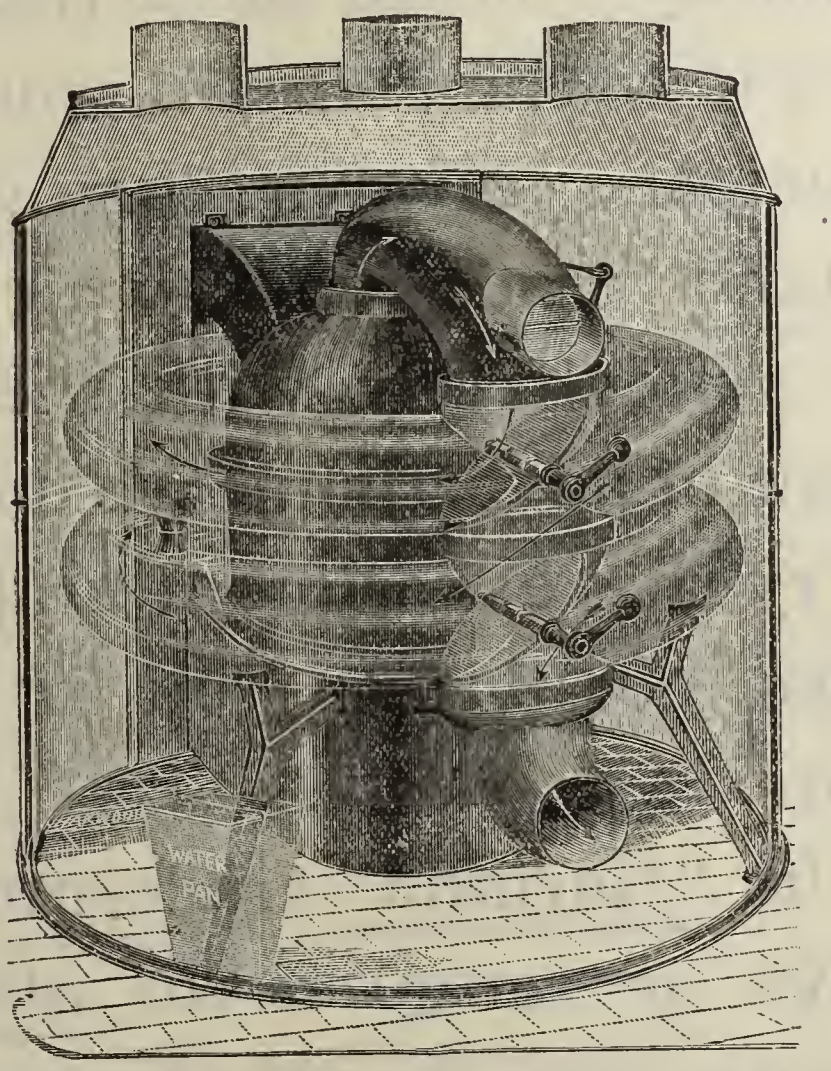
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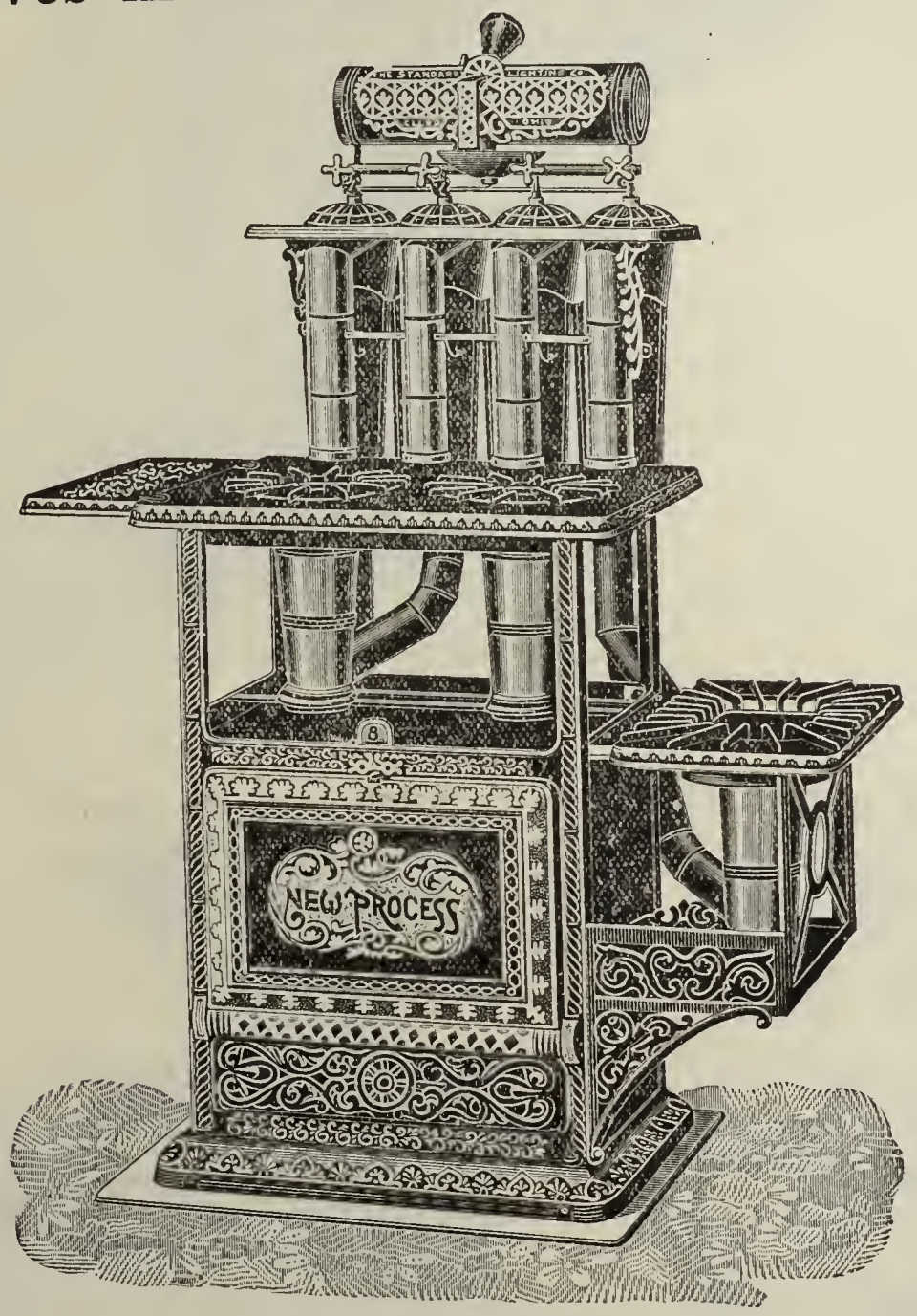
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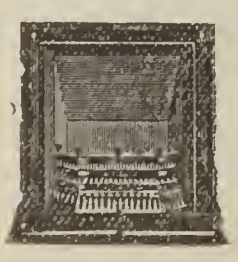


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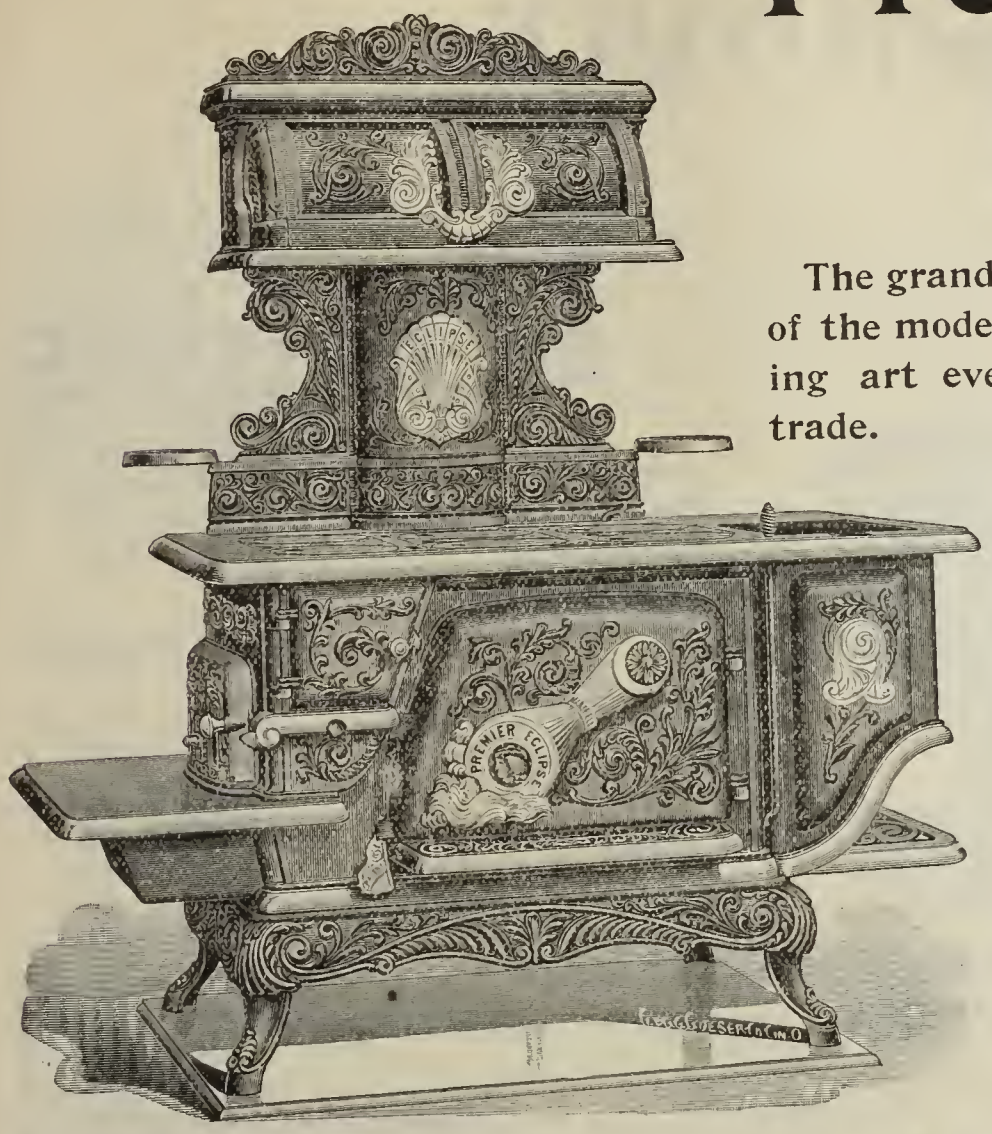


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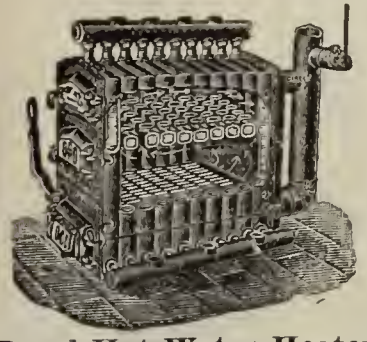
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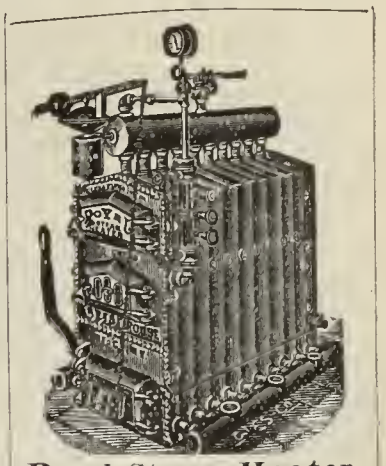
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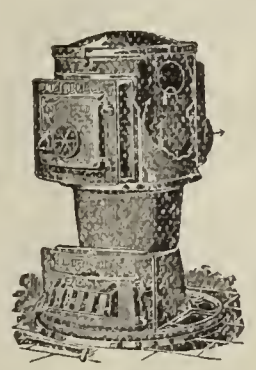
and not on their Antiquity.



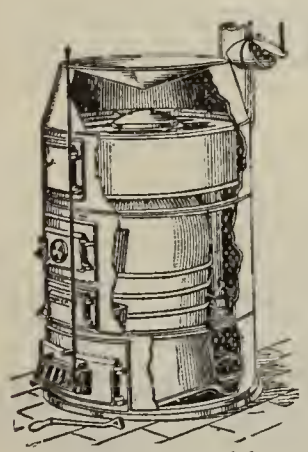
Royal Hot Water Heater.



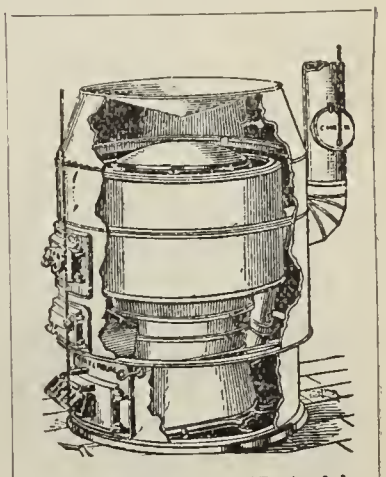
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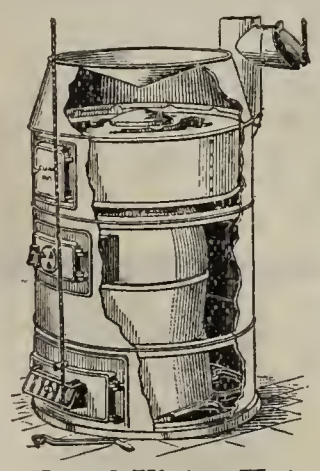


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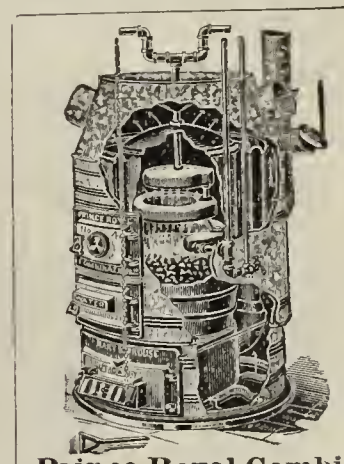


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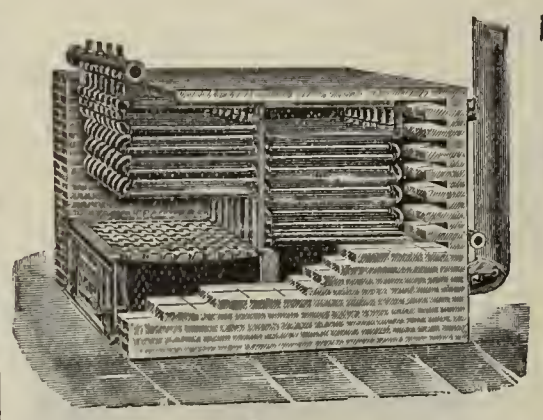
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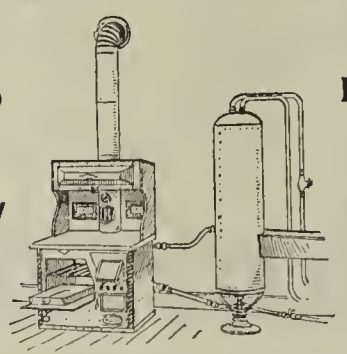
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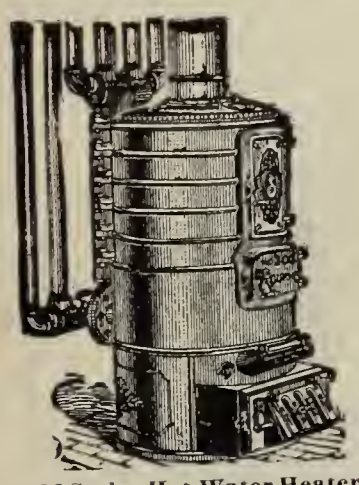
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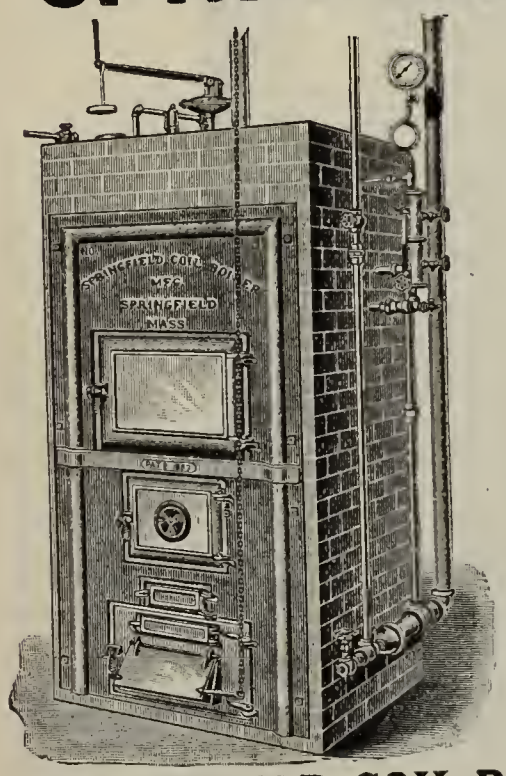


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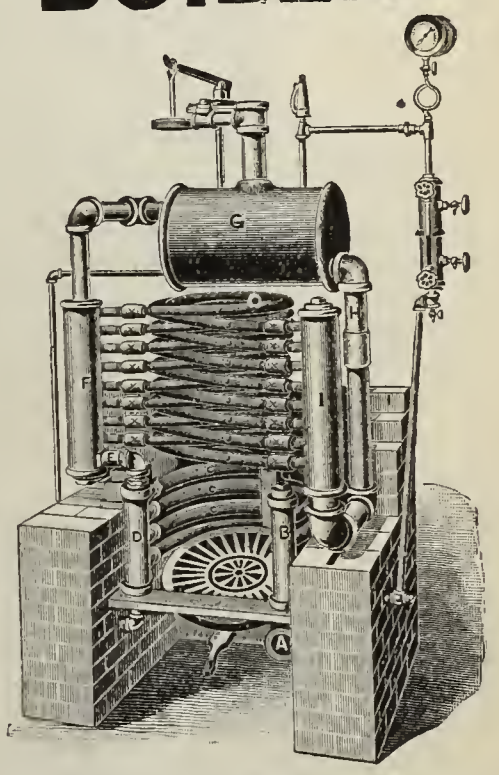


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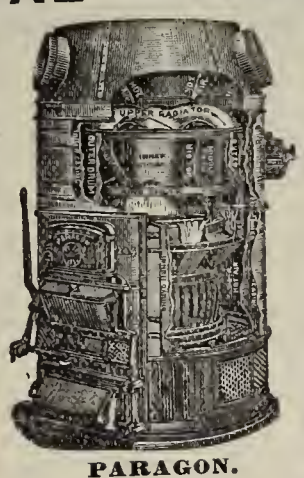
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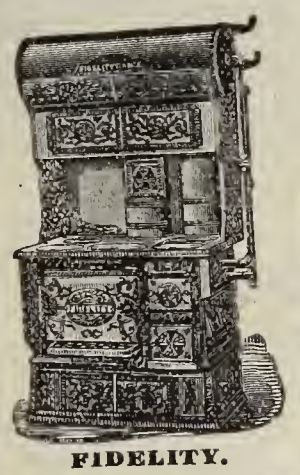
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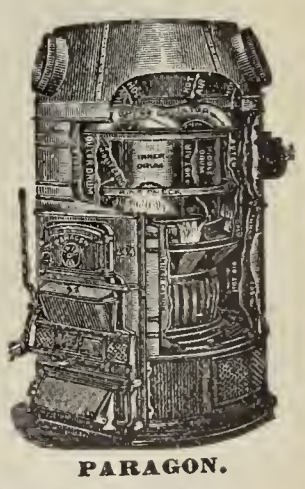
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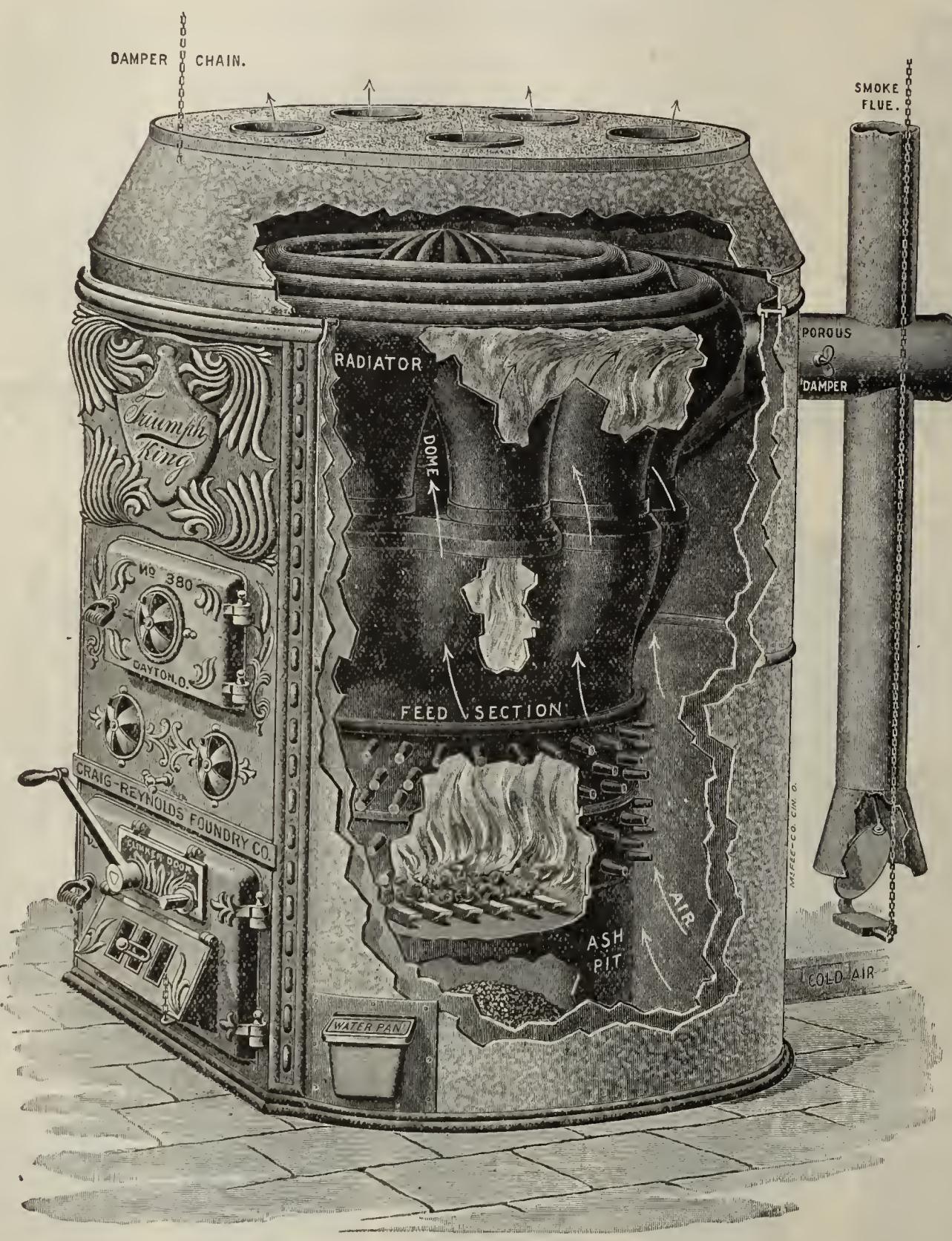
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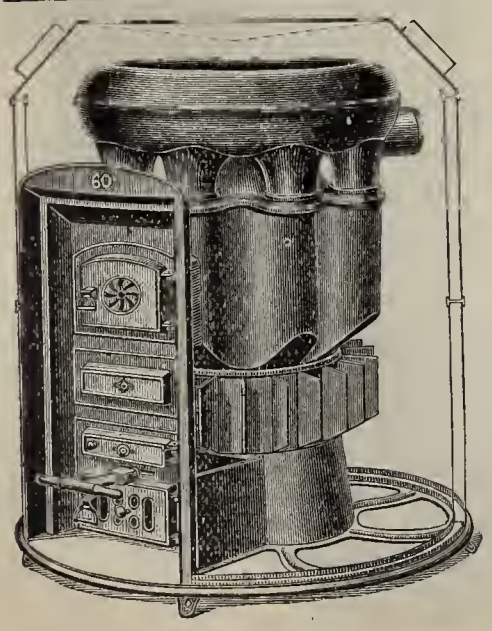
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"Middlin', middlin'."

"You used to say he was going to set the world afire."

"Huh! The only thing he ever set afire was my barn, and the thing wa'ant insured nuther."—*The Press.*

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DURABLE.
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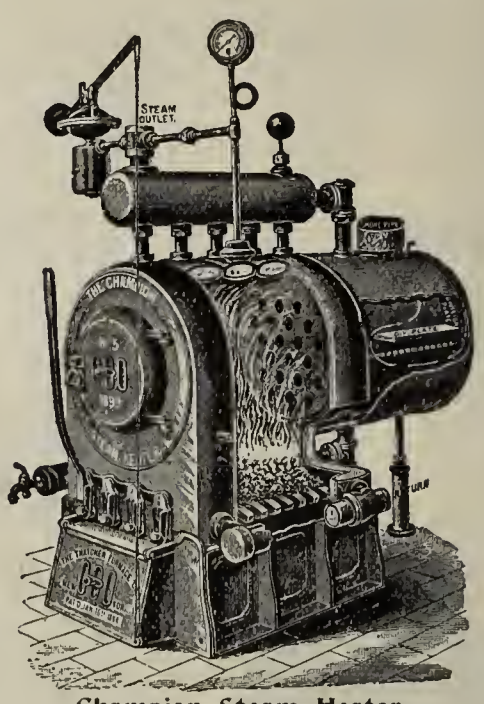
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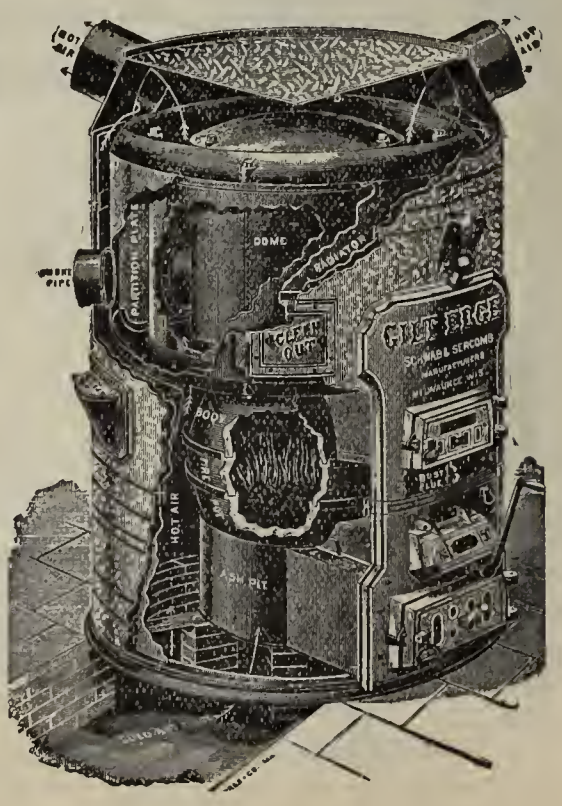
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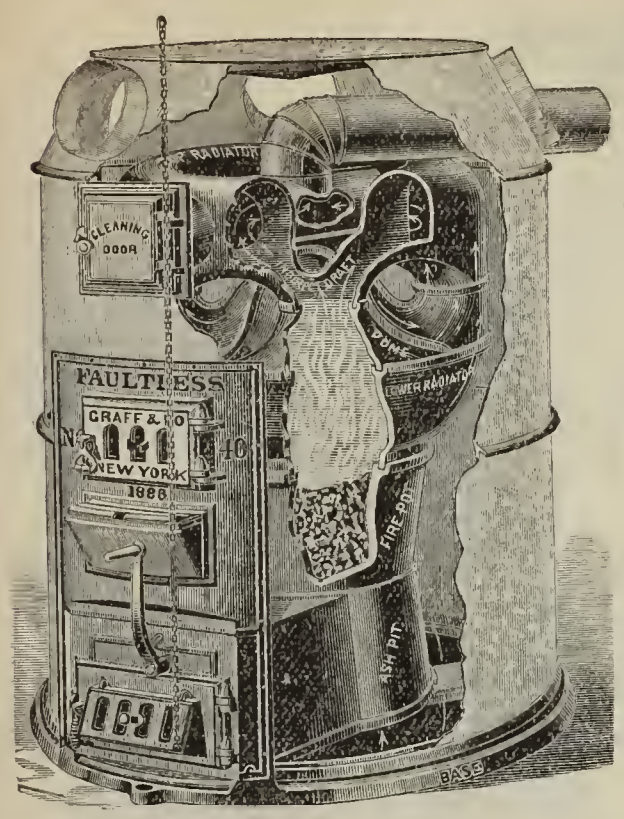
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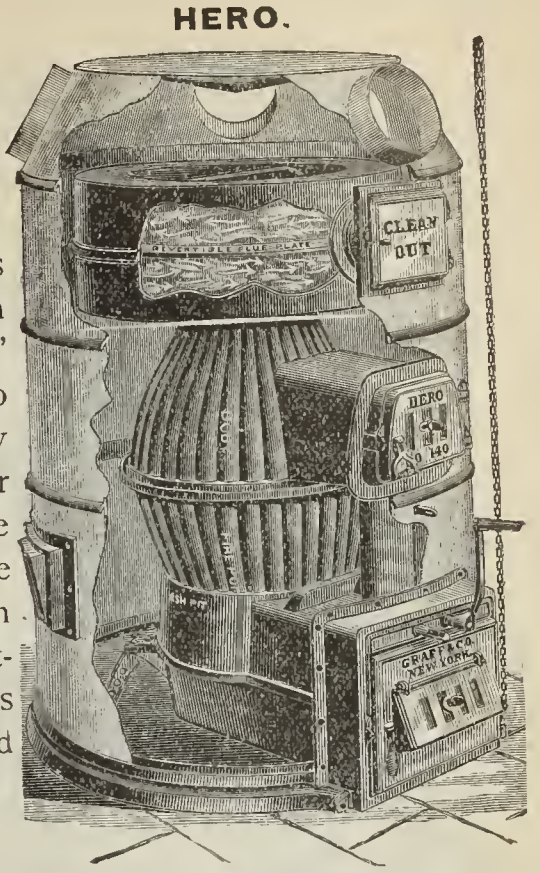
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Oh yes! These furnaces have such a reputation that they can 'go it alone." They no longer need to be pushed or heralded by us. "We see that your Furnaces and Ranges are in nearly every house we look at," is an express on we hear from house hunters almost daily. All this is the result of a good reputation.

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GRAFF & COMPANY, Manufacturers,
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BUY **OMAHA**



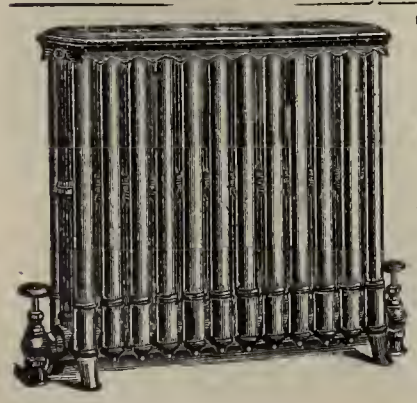
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45 YEARS.
Still superior to many of the productions of the present time. In fact, is a modern stove in every respect.

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— "YES," remarked a scientific man in the course of a lecture delivered recently "yes, all along the untrodden paths of the past we discern the footprints of an unseen hand."

SPRING.

Now the maiden comes out with a hat a-la-mode,
The grass cometh out with a hue, a-la-moder,
The bard to the season contributes an ode,
And the old garden rubbish contributes an odor.

—*Yonkers Gazette.*

— WHY HE CAME EARLY.—Mother (sitting down just as the train starts): "Oh, would you mind changing seats with me, sir? My baby wants to look out of the window."

Mr. Haven Hartford (with sarcastic politeness): "With pleasure, madam. I have been saving this seat for him for half an hour."—*Exchange.*

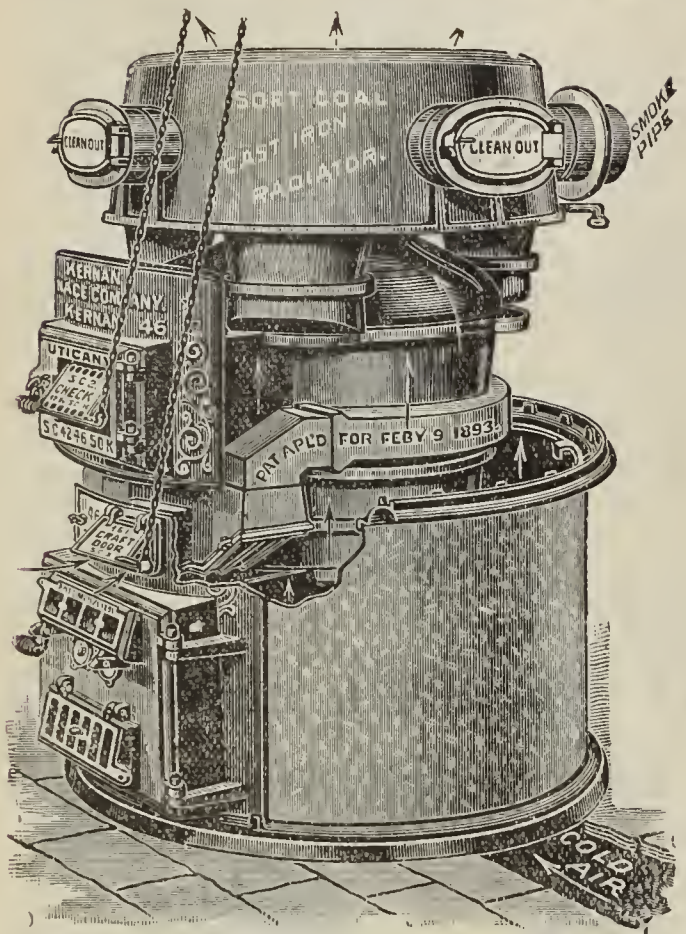
— NO JOKE FOR HER.—First Maiden (somewhat *passé*): "What is that statue?" (pointing to Diana).

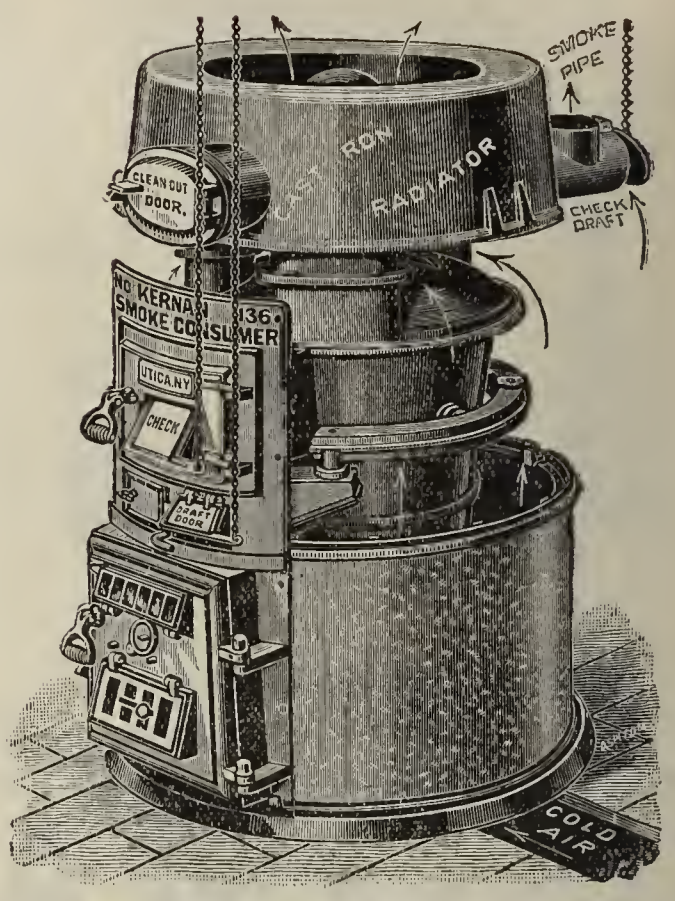
Second Maiden: "That's Cupid."

First Maiden: "I thought Cupid was smaller than that."

Second Maiden: "Possibly he's grown since you have seen him."—*Puck.*

KERNAN





SOFT COAL AND HARD COAL

Warm Air Furnaces.

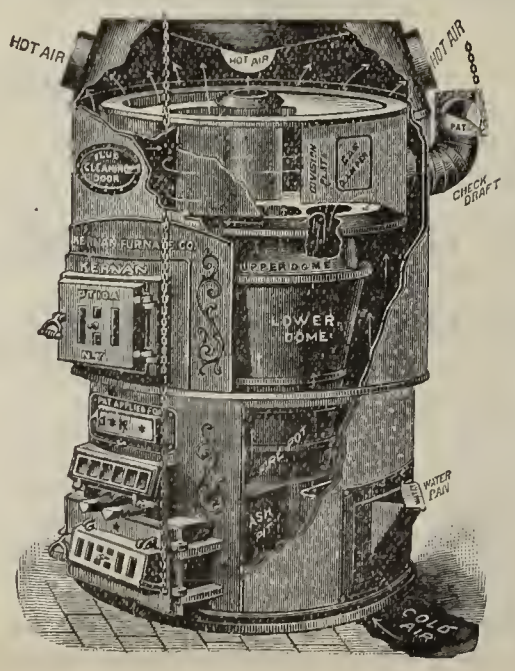
Steel Radiators! Cast Iron Radiators!

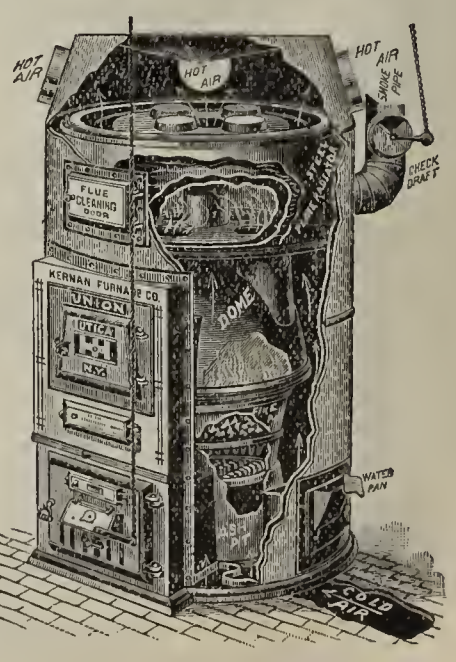
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KERNAN FURNACE COMPANY,

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BY

A. Mugford

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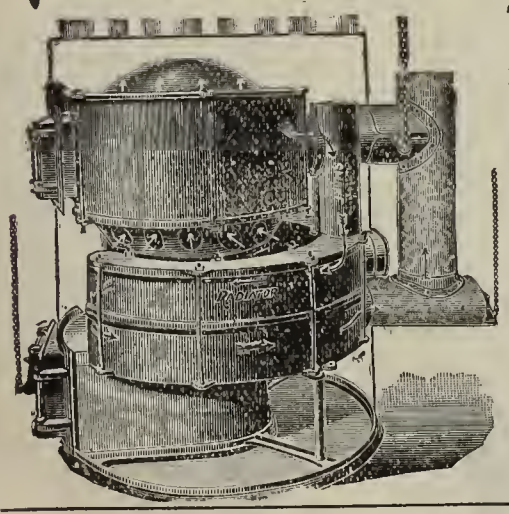
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AND MANY OTHERS.

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THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

It Is a Base Burner.
It Is a Great Economizer of Fuel.
It Does Not Heat the Cellar
It Is a Low Furnace.

The "Perfect" Ventilator

The "Crown" or "Stasch" Folding Bake Pan.

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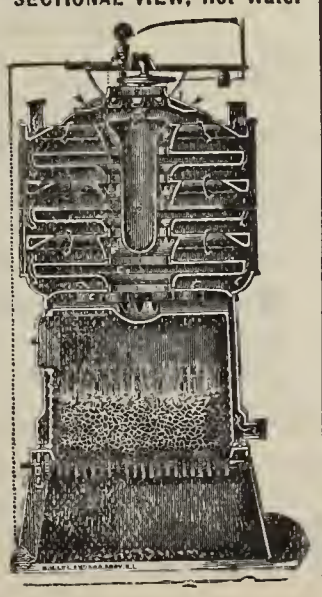
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SECTIONAL VIEW, Hot Water





A Spider Mechanic.

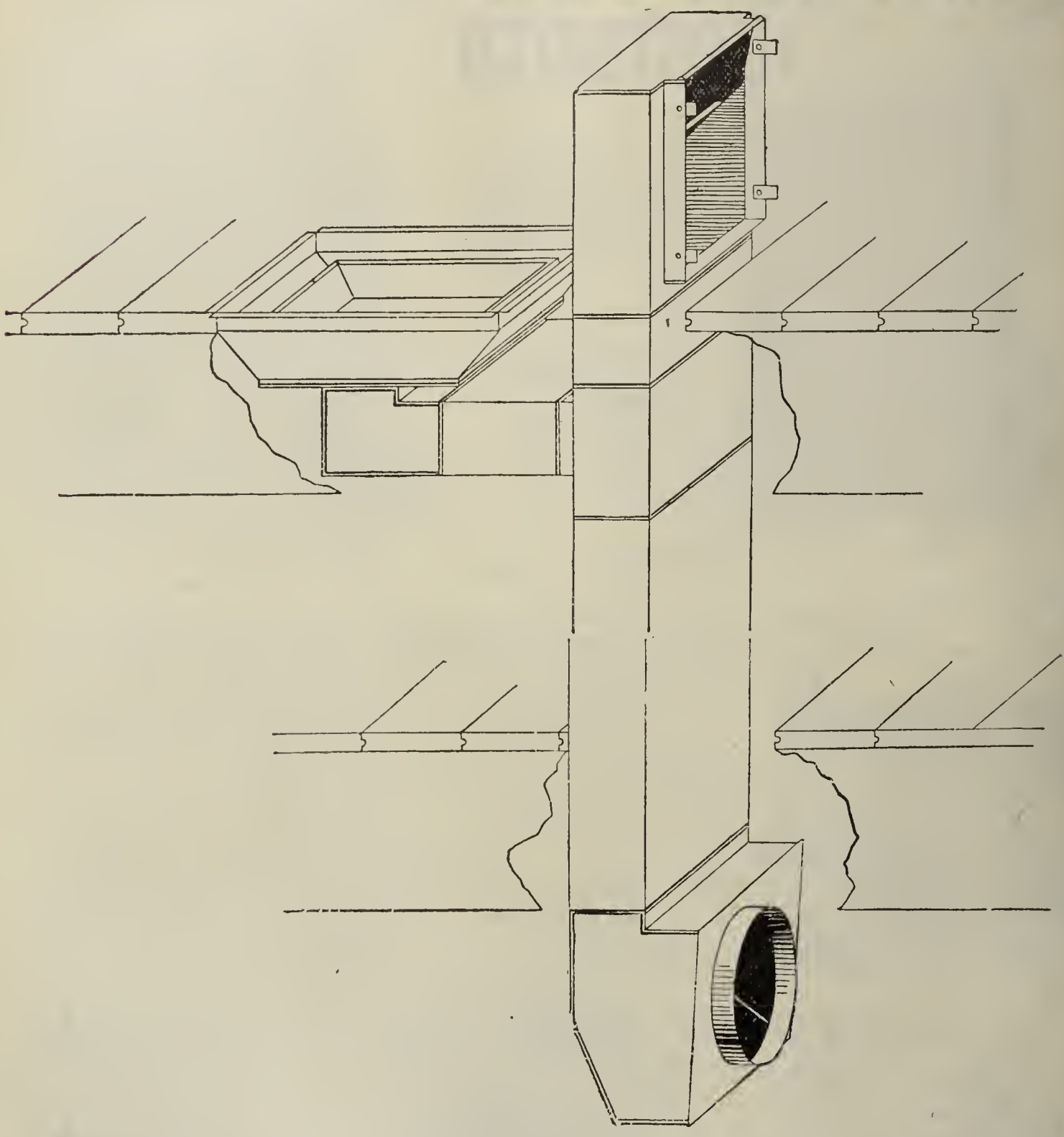
The spider has always been known as a clever constructor, but a correspondent of *Nature*, writing from Buenos Ayres, credits the insect with a knowledge of mechanics, giving the following interesting instance of the use of a stone by a spider as ballast for its web: "A web was noticed stretched between two trees at a distance of about 10 feet from one another. From it hung a thread about 2 feet long, and attached to its lower end was a small pebble about the size of a pea, the stone hanging free about 4 feet from the ground. The stone had evidently been made use of in this special manner by the spider for the definite purpose either for keeping the web taut or as ballast to give it stability against the wind, for on lifting the stone to remove the pressure it was observed that the web became limp and slack, and was stirred out of position by the least breath of air. This was noticed by a score or so of members of the German Turnverein here, in the garden of whose premises the occurrence took place."

— A Disagreeable Familiarity.— "It is most singular," said Mr. Greathead, 'that some people have the power of making themselves disagreeable and offensive in such a variety of ways. I recall an example of this in connection with my new suit of clothes. Now, I do not dress in the hight of fashion. On the contrary, I am a man whose object in life is to attract as little attention as possible. For this reason, although not having correct tastes in the matter of wearing apparel, I make use of my faculties as a keen observer, and generally succeed in being dressed with some regard to the prevailing mode.

"I purchased a new suit of clothes the other day at a ready made establishment. It was neat, but not gaudy, and arrayed in it I would not have attracted attention on Fifth avenue as an illy dressed man. In fact, I rather prided myself upon my selection. I have seldom seen suits for $8.45 which were so neat and well fitting. No sooner had I arrived at my place of business that day than I was accosted by one of my acquaintances, who is peculiarly versatile in his offensiveness. 'Hello. Greathead!' he yelled; 'heard you coming for blocks. By gee, you look like a fifteenth century astrologer covered with constellations and horoscopes. Fits like the tarpaulin over a truck on a wet day. Who built it?' Then he deliberately turned down my coat collar until he could see the label stitched to the lining, and in a loud voice proclaimed the name of the ready made clothing dealer from whom I had purchased the suit.

"However, I have caused that man to discontinue one way of making himself offensive. He has informed the attendants of the hospital where he is spending the summer that he will never again make remarks about eccentricities of dress."—*New York Tribune.*

A Good Thing
IN
Furnace Pipes.



We have it and want you to know it, and the only way this can be done is to allow us to mail you catalogue, price-list and discounts, or better still, ship you sample of pipe, which will better illustrate its good qualities than anything we can say.

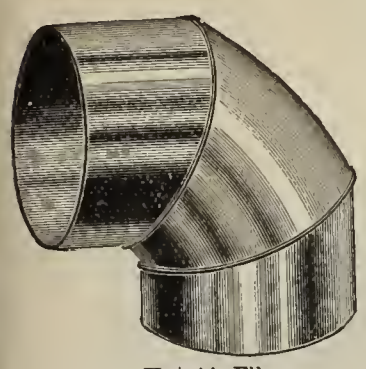
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Manufacture goods to suit your trade.
Ship promptly.
Guarantee satisfactory prices.

We are looking for your trade and will do anything within reason to secure it, and a postal card to our address will bring further information regarding this Good Thing.

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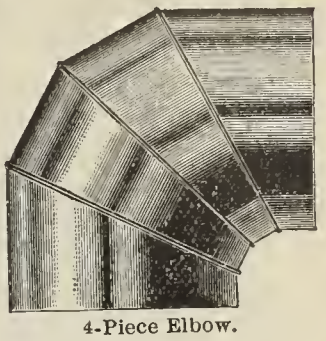


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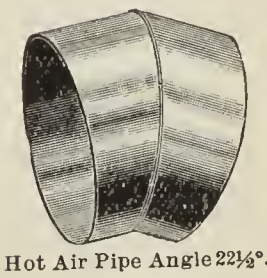
Metal Worker Coupon No. 4. Value $1.00 on first order of Fittings to amount of $10.00 or more.

The Excelstor Steel Furnace Co.

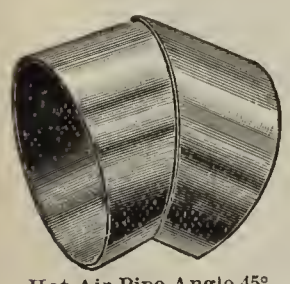
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3-Piece Elbows.	16	18	20	22	30	50	60	70	90	IX Goods 20% Advance.
4-Piece Elbows	18	20	22	25	35	55	65	75	1.00	
22½° and 45° Angles.	10	11	12	13	20	30	35	40	50	



Hot Air Pipe Angle 22½°.

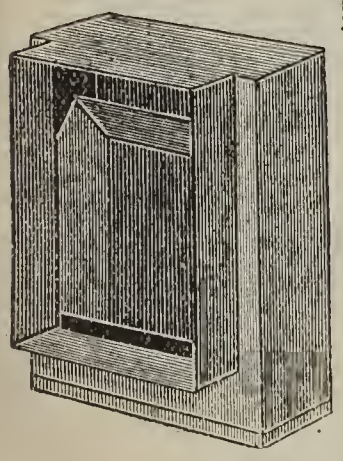


Hot Air Pipe Angle 45°.

Net f.o.b. cars Chicago in lots of 50 or more of two or more sizes. Freight will be allowed to points between Boston and Omaha if bills are paid in 10 days. If you have never used any of our goods cut out coupon, which is worth One Dollar.

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38 W. MONROE ST., CHICAGO.



Novelty Ventilated Wall Pipe,

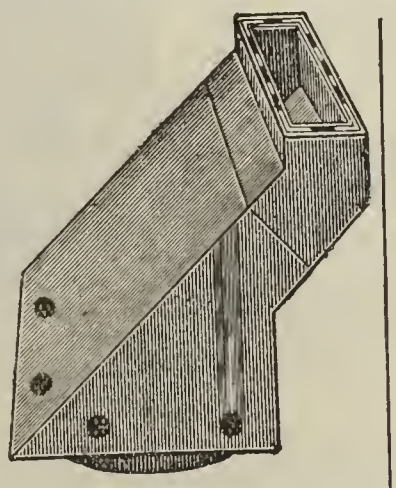
Absolutely Fire Proof.

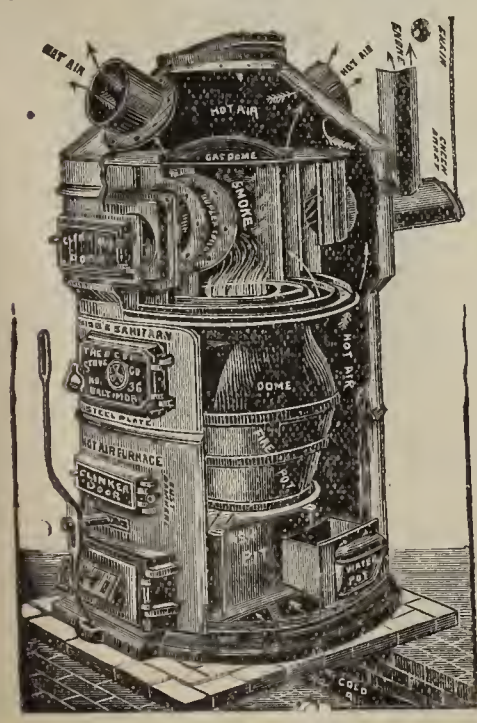
The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from ¼ inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

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THE B. C. BIBB STOVE CO.

BALTIMORE, MD.,

Manufacturers of

THE BIBB SANITARY HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

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And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW-WARE, &c.

Send for Catalogue with Testimonials.



— YOUNG MIDWAY (who has been to see Galla-Galla in Cairo street): "Oh, I say, old man, I know a good trick! Have you got a half a dollar?"

Old Plaisance (interrupting): "Bah, I know a trick worth two of that—have you a dollar?"—*Figaro.*

—"THE general willingness to give advice," said the man with a cold, "is something astonishing. And yet it isn't the abundance that worries me so much as the variety."—*Washington Star.*

— NOT WASTED.—Mrs. Billus (after the company had gone): "Johnny, you shouldn't have eaten those preserved fruits. They were not intended to be eaten. They were put on the table to fill up."

Johnny Billus: "Well, that's what I used 'em for, mamma."—*Chicago Tribune.*

— A NEW YORK drummer, when the train stopped "five minutes for refreshments," finished his luncheon, read his paper and complained that he *didn't know how to pass the rest of the time.*

Hello!



Permit me to introduce myself: I am--without blowing --the great ESTATE OAK.

For burning soft and hard coal, wood and lignite, with JOINTLESS AND AIR-TIGHT ASH PIT, CONTAINING LARGE ASH PAN AND SCREW REGISTERS.

I hold fire indefinitely and never crack or do anything except what the boss wants.

My folks have just made a new jacket for me, so I could add to my varied accomplishments and catch all the boys and girls everywhere, especially those who have been "stuck" on the extravagant and dudish square hard coal chaps.

My progeny has reached nearly THIRTY THOUSAND MEMBERS in three years since I was born, and there ain't one black sheep in the flock.

They tell me they are also going to continue making me with ROUND SHEET STEEL and CAST IRON BODIES like last year, except that I am to have a new hat, belt and necktie.

My folks have got me plastered all over with U. S. Letters Patent, and they declare they won't let anybody steal my tricks without a fight.

Honor bright and in dead earnest, I AM AN EXTRAORDINARY STOVE AND I BEAT THE RECORD.

My folks say I am to be sold at a very low price, but I ain't worrying about that. They have my full pedigree, &c., and if you want it, they will furnish it quick. They are O.K. fellows.

Oh, Yes! I forgot--I carried off the BLUE RIBBON and MEDAL at the World's Columbian Exposition, Chicago, last year.

My folks are

F. & L. K A H N & B R O S.

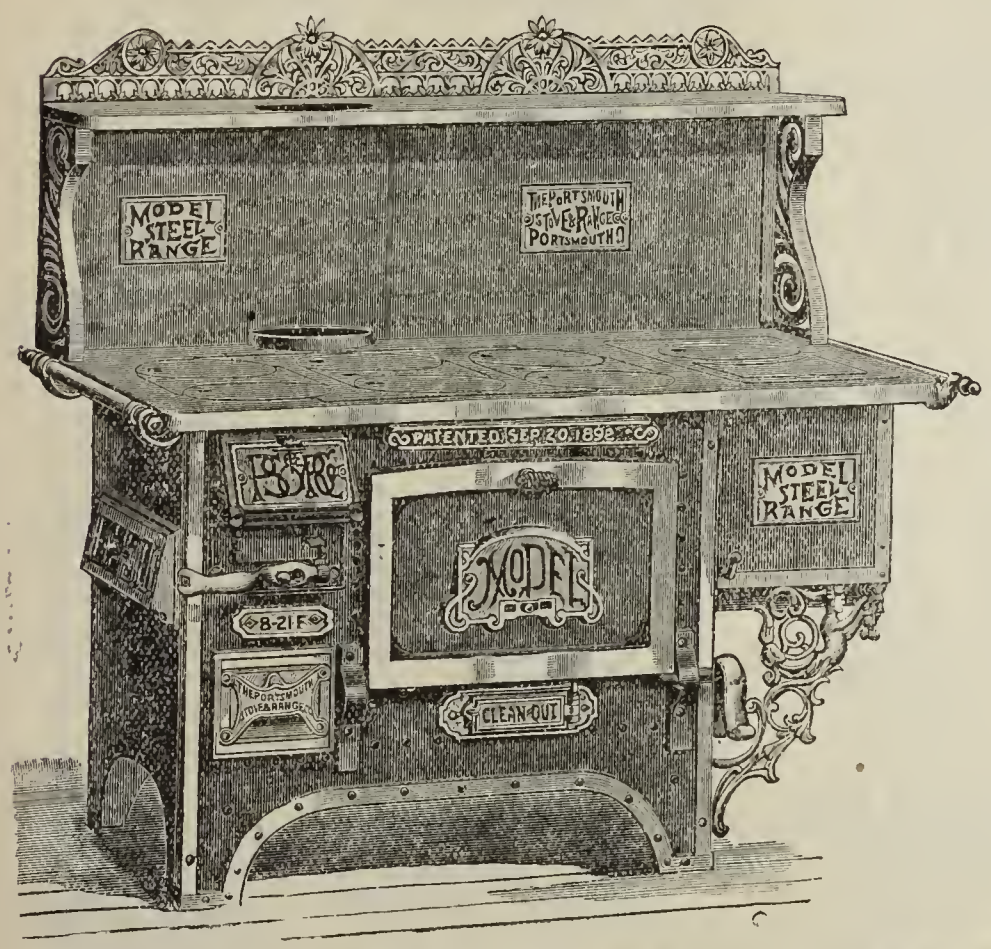
And my home is in

H A M I L T O N, O H I O.

N.B.--I have often heard confidential whispers that heaps of profit are made on me by the fellows who put me out to service.

The "Model"

With Flush-Top Reservoir.



WITH OUR VALUABLE ADDITION, THE

Rolling Damper,

which may be removed at will and permits entire freedom of draft. No rods, bolts or other parts in the way, to become loose or get out of order; something all have been striving for and the dealer has demanded It's the simplest and best of 'em all. The Model Ranges are the only productions of the kind embodying this and numerous other excellent features. Address for full particulars

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One, Two, Three and Four Burners, with or without Bases and Closed Tops.

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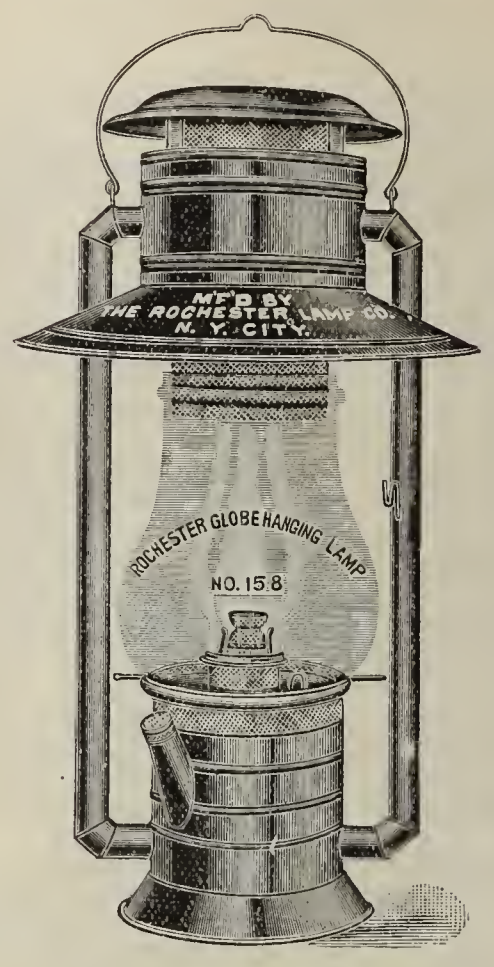
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Three times the light of the old flat-wick street lamp, and as far in advance of it as the kerosene light is ahead of the tallow dip. Protected by metal gauze against bugs or insects. The globe is held up by hook while trimming or lighting. No broken chimneys, no flickering light. Takes regular No. 3 or 9 street lamp globe, to be had everywhere. For Railroad Stations, Warerooms, Mills, Docks, etc., it is the best lamp ever made.

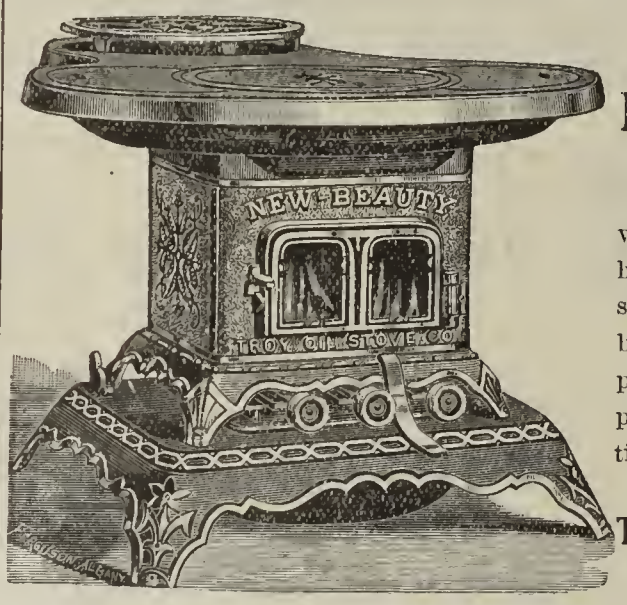


We have it at last—"The Rochester" as a street lamp! The first and only Tubular Globe Central Draft Lamp ever made! Storms, rain, snow, sleet or hail do not affect it. Burns all night. Made with either bail or post socket, with 26 inch enamel reflector if wanted, for railroad and other uses. Dealers should order a sample at once of this new lamp. Price $6. Send for discount to the trade.

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THE ROCHESTER LAMP CO.,

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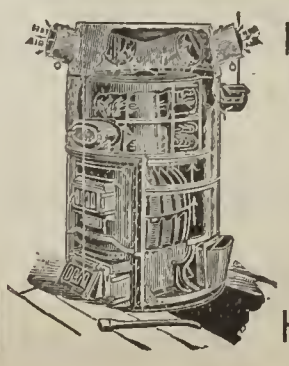


Beware of Infringing Stoves.

Parties dealing in oil stoves would do well to compare the hinge on this stove that the body swings on with others that may be offered them, as we are the patentees of said hinge, and shall protect ourselves against all parties infringing.

TROY OIL STOVE CO.,

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The Boomer is a Success.

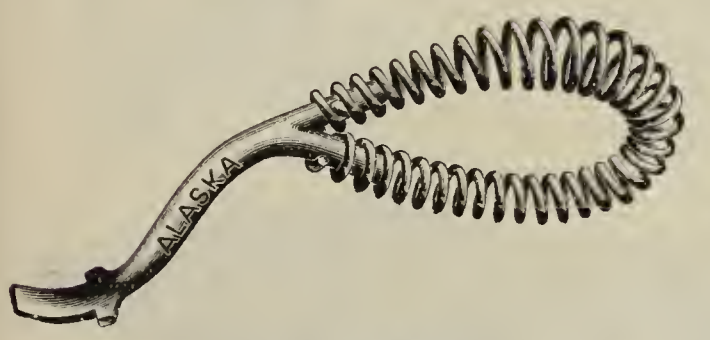
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Write for Catalogue, which explains all about the Boomer.

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MADE UNDER THE GAITLEY PATENTS.



STOVE KNOBS AND

HANDLES, TOWEL RODS,

KETTLE BAILS.

ALWAYS COLD.

POKERS, LID LIFTERS, SHOVELS, FIRE SETS.

Are good sellers. Send for prices to Hardware Jobber.

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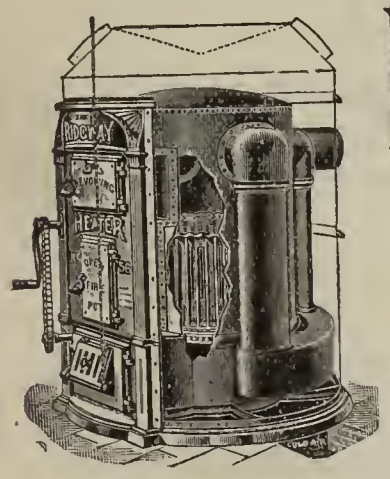
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An Impending Evil.

Spring was everywhere in the air as the tramp came through the back gate, and some of it seemed to have got into his step as he ambled along towards the home.

"Ah, good day," he said cheerily to the hired girl, who was disporting herself on the kitchen steps with a scrubbing brush.

She looked at him and nodded.

"What's the chances for a bite to eat this beautiful morning in spring?" he inquired.

"Not a mouthful in the house," she replied.

"Struck a famine?"

"No, something worse."

"What can that be?"

"Part of Coxey's army; they came by this morning early and got everything we had to give away."

All the blue went out of the sky of the tramp's face, and the lowering clouds swept over it.

"Bah," he growled, "them chumps is goin' to ruin the perfesh and drive us steady workers to the poorhouse er to marryin' rich wives." and he stalked out of the yard in a fit of disgruntlement.—*Detroit Free Press.*

— SNOOPER: "I'd have you know I come of a good family."

Ricketts: "You must have traveled a long distance."—*Vogue.*



No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8⅛ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

Dealers who Handle B. & B. STOVES

Make Money at Both Ends.

There are no old relics or fossils in the B. & B. line.

B. & B. STOVES ARE ALWAYS AHEAD.

Our competitors try to imitate, but the race is too rapid for them.



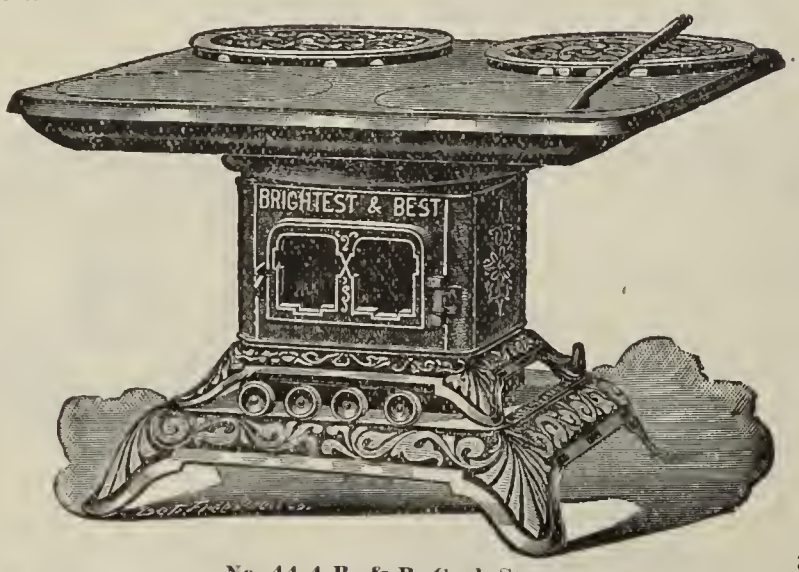
No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozeu in box. Weight, 85 pounds. Height, 8½ inches. Size of Tank, 5½x5¾. NICKEL FRONT. Two 4-inch wicks.



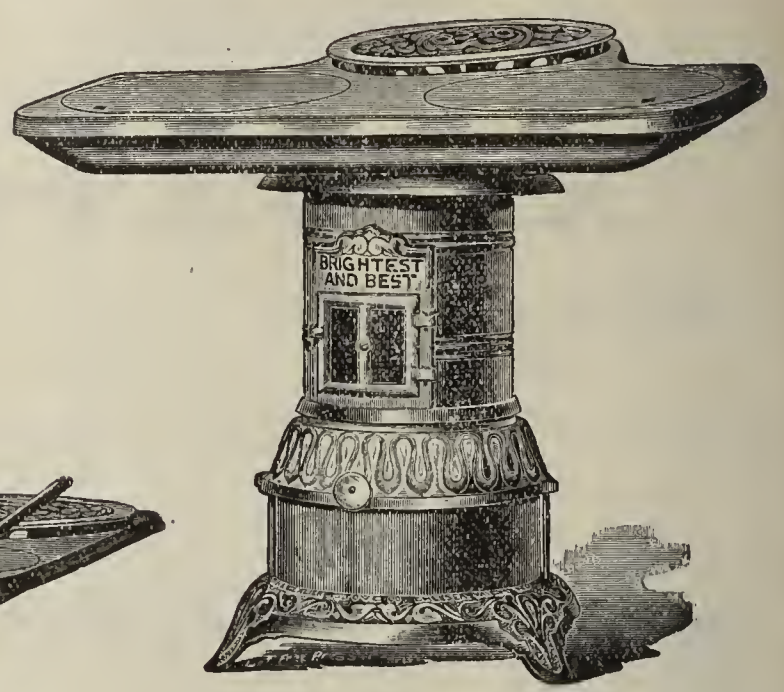
No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozeu. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8⅛ inches. Size of Tank, 6½ x 8⅛ inches. NICKEL FRONT. Three 4-inch wicks.



No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.



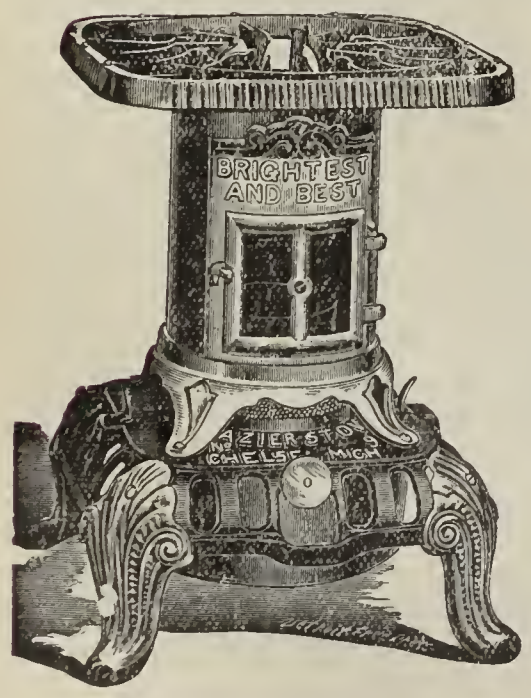
No. 6–3 B. & B. Cook Stove.

Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.

THE GLAZIER STOVE COMPANY. TRADE MARK. B&B OIL & GAS STOVES BRIGHTEST AND BEST. CHELSEA MICH.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**



No. 8. B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. 7½ inch double thick circular wick.

It will pay you to consider these points.

We Are After Your Trade.

You will always find the B. & B. Stoves up to date in every particular.

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Hibbard, Spencer, Bartlett & Co., Chicago,	"	Northwestern "
W. W. Montague & Co., San Francisco,	"	Pacific Coast "
Prescott Brothers, Boston,	"	New England "
Bindley Hardware Co., Pittsburgh,	"	Eastern "

THE GLAZIER STOVE CO., Manufacturers, CHELSEA, MICH.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, May 26, 1894.

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Building Restrictions.

The past few years have witnessed great advances in the enactment of laws designed to so control the erection of buildings as to render them in every way safe for the occupants. Scarcely a city of any size can now be found that does not possess a code of building laws, while sizes of timbers, thicknesses of walls, provisions for escape in case of fire, as well as precautions to prevent fire itself, are all to be in accordance with the said laws. In the larger cities competent inspectors have laid upon them the duty of enforcing the laws, and, as a rule, in a somewhat less efficient manner, the matter receives attention in smaller municipalities. Of most interest to our readers is the subject of heating in its relation to legal protection against fire. Much of the good legislation in this line has been at the instigation or through the co-operation of the fire underwriters. They are certainly in a position to accurately judge of the practical efficiency of any arrangements that may be legalized, but too frequently their good judgment has been outweighed by exigencies of politics. Thus many laws of this character bear the marks of the influence, politically applied, to make the restrictions agreeable to persons who look only for the cheapest but not the best way in all things.

Diversity in Building Laws.

As a consequence there exists to-day a surprising diversity in the laws relating to the installation of heating systems. It is obvious that only one of them all can be exactly right, and yet the variety is to a certain extent excusable when we consider that in many cases the law makes the arrangement more than safe enough, and hence differs from those which approach nearer the danger line. Nowhere is this more noticeable than in the matter of permissible distances between heating pipes and adjacent wood work. Even a superficial inspection of the building laws relating to hot air pipes in some of the principal cities of the country will serve to clearly show this wide diversity. Thus, in Boston the law reads that all hot air pipes shall be 1 inch from the wood. The same holds true with steam pipes, and this distance must be maintained with either hot air or steam pipes unless the wood work is protected by metal casing or by stone or earthen ring. The laws in Providence and St. Louis are substantially the same. In Chicago, however, we find the other extreme. Here the hot air conductors, if placed within 10 inches of the wood work, must be made double, with at least ½ inch air space between the two. Steam pipes, on the other hand, need be kept only 2 inches from wood unless protected. Chicago, like many other cities, very exclusively dictates the material to be used in the construction of its pipes—in this case IC or IX bright tin. Under the law, literally followed, galvanized iron cannot be used. Of course it is, however, and the crudeness of the law thereby illustrated. The Cleveland restrictions are nearly the same, except that the steam pipe distance is increased to 6 inches, and the Milwaukee law is identical with regard to hot air pipes. Memphis has an elaborate series of restrictions. It dictates that all brick or stone hot air shafts shall be lined with tin pipes, something very desirable, it must be admitted, but entirely unnecessary, as a matter of fire protection, under all ordinary conditions. Elaborate arrangements are required in the case of all flues; thus it is necessary, under the law, that all metal flues or pipes for the conduction of heated air shall be inclosed with 4 inches thickness of hard incombustible material, except in the case of horizontal pipes, which must be double, the inner one 3 inches from the stud, with ½-inch air space between itself and the water pipe. In addition, the inside faces of the exposed stud must be well lined with tin plate and the outside with iron lath or slats. Horizontal hot air pipes must furthermore be kept 6 inches below floors or ceilings if they are unprotected, or 3 inches if protected by a metal shield. Hot air pipes passing through partitions must have 4 inches of brick insulation or else a double collar of metal with 2-inch air space and holes for ventilation. Steam pipes may be placed within 2 inches of wood work, or within 1 inch if protected by metal shield. New York City has a code of regulations practically identical with that of Memphis. Cincinnati makes the required distance of steam and hot air pipes 6 inches from unprotected combustive material, but makes all arrangements subject to approval of inspector. Detroit limits the distance to 3 inches. Denver requires metal flues to be double or wrapped in incombustible materials if not placed in stone or brick walls. San Francisco has a similar law, which specifies that the double pipe shall have ½ inch space filled with fire proof material.

Opportunity for Revision.

Many more examples might be given, but enough has been shown to indicate that there are either most reckless risks taken under some of the laws, or else the safeguards prescribed in others are practically unnecessary. Notwithstanding the numerous experiments that have been made, it is still an open question just how far removed wood work must be from steam and hot air pipes to avoid danger by fire. Of course, this uncertainty is largely due to the conditions under which the pipes are installed and the system is operated, and a distance that is safe where there is ample ventilation around the pipe may become dangerous when the pipe passes through a partition and opportunity is given to overheat both air and wood work. It would seem that the most practical method of revising existing laws which have proved unsuitable would be to carefully and exhaustively study the laws of other municipalities in connection with the reports of the fires occurring within their limits. The inspectors, the fire department and the underwriters are all supposed to express, when possible, their knowledge or belief in the cause of a fire, and the extended examination of such reports must serve to show the adequacy of existing laws. In connection with the celebrated trial of the Chicago Anarchists, the judge gave us in a single sentence the spirit that should rule in all law making: "The law is common sense." Most truly is common sense called on to establish the perfect and comprehensive building laws that are necessary in every community to protect its citizens, so far as may be possible, from all danger through improper construction of their dwellings, their factories, and their places of amusement, instruction and worship.

A Boston Trade School.

In another column will be found some details in regard to one of the latest additions to the trade school movement in the United States, the plumbing school started in January last in connection with the North End Union of the city of Boston. The success of this school during its brief existence indorses the conviction, so often expressed by advocates of the trade school system generally, that the establishment of such vehicles of definite trade instruction is loudly called for

by the classes for whose benefit they are designed. Every opportunity of the kind that has been offered to American boys has been eagerly seized upon, and the number of applicants for instruction has usually—as in this case—far exceeded the available accommodation. This has been the history of the plumbing classes, at least, in New York, Brooklyn, Philadelphia, and other cities where trade schools are in operation, and it is not surprising that the Boston school should have had the same experience. If the resolution of the trustees of the Franklin legacy to establish therewith, in Boston, a trade school of noble proportions is firmly adhered to, the city will receive a still wider benefit in this line.

Leaders in Steam Heating.

It was not so long ago that information on hot water heating was sought altogether from England, because this method of heating, in one way and another, had been in use there for a number of years. With the more convenient fittings made in the United States and the use of wrought iron pipe, however, rapid advance was made in the work, and less dependence was placed upon the teachings of English practice. In steam heating the case is just reversed, and engineers of foreign countries seek information in the United States with the same interest and confidence with which they themselves were formerly consulted respecting hot water. Architects in England, France, Germany, Russia and the Scandinavian Peninsula have sent plans of projected buildings to leading engineers in this country for instruction as to the method of heating by steam. These plans have been returned with a description of the necessary plant and full explanation of the rules used in calculating the surface required on the heat unit basis, and drawings have been furnished showing the method of installing the plants from the heating apparatus to the smallest detail of the piping. In a number of instances the heating apparatus, pipes and fittings, with valves and radiators, have been shipped abroad, each part being marked and described so that the plant could be erected entirely by foreign labor.

In consequence of the recent discovery of frauds in the Boston Custom House, Secretary Carlisle has issued an order to the special Treasury agents directing them to examine every bonded warehouse in the country. The agents in New York City have already begun their inspection, which it is estimated, will occupy one year at least, as there are some 70 to be gone through.

Last week was a sad one for the fire insurance companies in the East. Beginning with the destruction of the Brooklyn Tabernacle and the adjoining hotel on Sunday, May 13, almost every day scored records of large and destructive fires in New York, Boston, Brooklyn and Philadelphia.

Institute of Building Arts.

The Institute of Building Arts is a permanent exhibition of building materials and improvements, and is owned and conducted by the Illinois Chapter of the American Institute of Architects at 63 to 69 Washington street, Chicago. The institute was established for the purpose of centralizing information relating to building, and congregating in permanent exposition all materials, appliances or inventions of a practical or ornamental character. The building is free to the visiting public, who are welcome to all its advantages and information and to the inspection of the numerous exhibits it contains. It embraces a library of architectural works, including files of all architectural and building journals, and contains assembly rooms for the meetings of all associations connected with architecture and the building arts.

The Illinois Chapter of the American Institute of Architects will hold their first annual special building trades and material exhibition at the Institute of Building Arts, from May 15 to June 2, 1894, inclusive. It will be known as the Chicago Building Trades and Material Exhibition, and will be held in the new permanent addition to the institute, which now comprises the larger part of the second floor of Nos. 67 and 69 Washington street, besides the whole of the second floor of Nos. 63 and 65. The exhibition will be supplementary to the permanent exhibit of the Institute of Building Arts, which has been in existence for many years. The privilege of exhibition is given not only to manufacturers, manufacturers' agents or contractors, or the proprietors of any building material, but the artisans, mechanics, decorative artists, wrought iron workers and carvers who may desire to show specimens of their mechanical or artistic skill. Among the permanent and special exhibitors at the institute can be mentioned the following :

Boiler Attachments.—Reliance Gauge Company, Cleveland, Ohio.

Blinds.—Willer Mfg. Company, Milwaukee, S. A. Bradley, manager, 183 and 185 Dearborn street, Chicago.

Engines.—New York Safety Steam Power Company, 56 to 60 South Canal street, Chicago.

Elevator Guards, Railings, &c. — Northwestern Expanded Metal Company, Twenty-sixth street and Stewart avenue, Chicago.

Fire Proof Construction.—Bostwick Steel Lath Company, Niles, Ohio, W. G. Hurlburt, secretary, 161 La Salle street, Chicago; Guastivino Fire Proof Construction Company, 1300 Auditorium, Chicago; Mackolite Fire Proofing Company, 824 Schiller Building, Chicago; Northwestern Expanded Metal Company, Twenty-sixth street and Stewart avenue, Chicago; John A. Roebling's Sons Company, 171 and 173 Lake street, Chicago ; T. O'Shae, 80 Twenty-fifth place, Chicago.

Fire Proof Lath.—Bostwick Steel Lath Company, Niles, Ohio, W. G. Hurlburt, secretary, 161 La Salle street, Chicago; Northwestern Expanded Metal Company, Twenty-sixth street and Stewart avenue, Chicago; John A. Roebling's Sons Company, 171 and 173 Lake street, Chicago.

Gas Ranges —George-M. Clark & Co., 135 to 161 Superior street, Chicago; Mason & Davis Company, 72 Lake street, Chicago; Milwaukee Gas Stove Company, Milwaukee, Wis.; Schneider & Trenkamp Company, Cleveland, Ohio, H. R. Hamilton, agent, 67 and 69 Lake street, Chicago.

Hardware Specialties. — Cannon & Gibbs, 397 W. Lake street, Chicago; Duplex Hanger Company, 584 Pearl street, Cleveland, Ohio; F. S. Hutchinson Company, West avenue and Sixth street, Long Island City, N. Y.; Lane Bros., Poughkeepsie, N. Y.; M. B. Swezey, 120 Twentieth street, Chicago; Reading Hardware Company, 73 Wabash avenue, Chicago.

Heating Appliances.—F. Farquhar & Sons, Blue Island, Ill.; W. H. Page Boiler Company, Norwich, Conn.; S. Wilks Mfg. Company, 113 to 123 Clinton street, Chicago.

Pipe Covering and Insulation.—A. C. Kemper, 208 and 210 Lake street, Chicago; H. W. Johns Mfg. Company, 242 Randolph street, Chicago; Western Mineral Wool Company, 437 Rookery, Chicago.

Plumbing Specialties —Alberene Stone Company, 219 Dearborn street, Chicago; B. P. Bower & Co., 41 Academy street, Cleveland, Ohio ; Wm. S. Cooper Brass Works, 442 North Thirteenth street, Philadelphia, and 219 Dearborn street, Chicago; Detroit Sanitary Supply Company, 37 First street, Detroit, Mich.; Du Bois Mfg. Company, 245 Ninth avenue, New York; G. C. Geraty, 307 East Fifty-fourth street, Chicago; Adams & Westlake Company, 110 Ontario street, Chicago; J. C. Hartford & Co., 57 Dearborn street, Chicago; L. Wolff Mfg. Company, 91 Dearborn street and 93 West Lake street, Chicago; P. H. Gunderman, 889 North Halsted street, Chicago; Thos. Kelly & Bros., 124 Franklin street, Chicago; Norton Bros., Masonic Temple, Chicago; Sanitas Mfg. Company, 217 Lake street, Chicago; Steel Bath Mfg. Company, Detroit, Mich.; J. J. Wade & Son, 276 Dearborn street, Chicago.

Pumps. — Erwin - Welch Hydraulic Machinery Company, 51 South Canal street, Chicago ; U. G. Reynolds, Chicago.

Registers and Ventilators.—Tuttle & Bailey Mfg. Company, 136 Lake street, Chicago.

Screens.—E. T. Burrowes & Co., Portland, Maine ; H. B. Dodge & Co., 65 Washington street, Chicago ; Willer Mfg. Company, Milwaukee, Wis., S. A. Bradley, manager, 183 and 185 Dearborn street, Chicago.

Sewer Specialties.—James Barrett, 193 Tremont street, Boston, Mass.; E. J. Flanedy, 168 South Peoria street, Chicago.

Steel Ceiling.—Fred. F. Bischoff & Co., 24 to 26 West Lake street, Chicago.

Valves —Chapman Valve Mfg. Company, 24 West Lake street, Chicago; Jenkins Bros., 31 North Canal street, Chicago.

Window Improvements. — Gardner Sash Balance Company, First National Bank Building, Chicago; Howarth Reversible Sash & Sash Center Company, 112 and 114 Antoine street, Detroit, Mich.; McDonough Mfg. Company, Eu Claire, Wis.

Wood Carving.—Gustave Behm, 641 Larrabee street, Chicago.

The Illinois Chapter of the American Institute of Architects informally opened their new library and assembly rooms, Monday evening, May 14, in connection with the first annual exhibition of the building trades and materials. There were in attendance the most prominent architects of Chicago, builders and exhibitors. Special medals of silver are to be made after designs furnished by George Beaumont, and these are to be awarded to such exhibitors as may be deemed entitled to them by a jury of experts to be appointed.

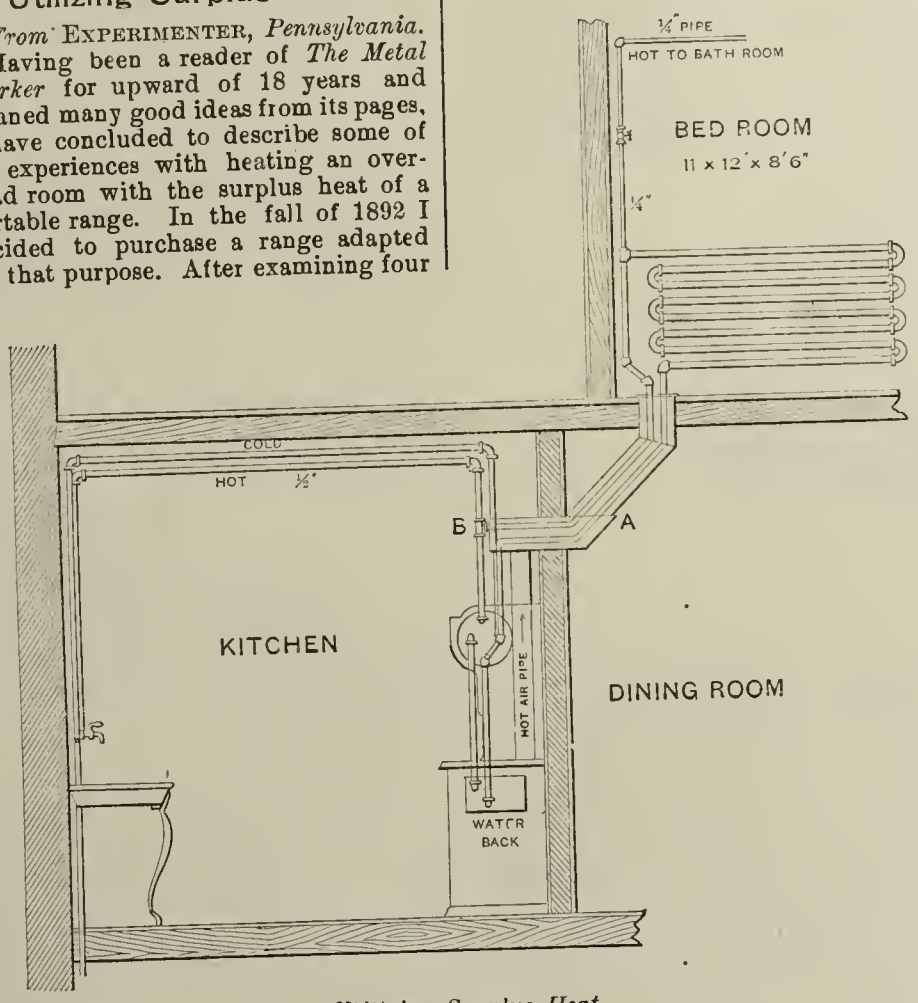
THE LETTER BOX.

Machine or Tool.

From F. A. R., *Brooklyn.*—In reply to the inquiry of "M. J. C.," Elwood, Ind., which appears in *The Metal Worker* of May 12, I consider the term "machine tool" a very wrong name for a lathe. A lathe is as truly a machine as is the brake or stamping machine. Machine tools are tools placed within a lathe, brake or press to perform on whatever work is placed in the machine. If lathes be called tools, what will you call the numerous appliances that do the work placed in a lathe?

Utilizing Surplus Heat.

From EXPERIMENTER, *Pennsylvania.*—Having been a reader of *The Metal Worker* for upward of 18 years and gleaned many good ideas from its pages, I have concluded to describe some of my experiences with heating an overhead room with the surplus heat of a portable range. In the fall of 1892 I decided to purchase a range adapted for that purpose. After examining four different makes, I found it rather difficult to decide which one to select as the most efficient and economical, but finally selected a No. 80 Fidelity range, because the hot air outlet was somewhat larger than that of the others, also because the hot air attachment was an independent feature, placed on the end of a complete range, so that it could not possibly chill the oven, which, it is claimed, is the case with some heating ranges. After placing the range in position and connecting the hot and cold water pipes, I cut a hole through the partition and floor, putting in a 5 x 8¾ inch square pipe, to which I connected the 3½ x 8½ inch oval hot air pipe from range. At A on the sketch a hinged cover (not shown in detail) was placed, which when closed threw the heat upstairs. On opening this cover and closing the damper in square pipe, the hot air was thrown into the dining room. The result was quite gratifying. As the family did not use much hot water and the fire was kept burning briskly at all times, the water in the boiler boiled and at times generated steam. The thought suggested itself that a coil could be placed up stairs, and by leaving the door to back room open assist in keeping it warm. After some search a second hand coil, consisting of 40 feet of 1-inch pipe, was secured. This was rather more pipe than was requisite, but being averse to spending any time on alterations I concluded to risk it. The coil was placed in position and a tee was placed on the cold water pipe from the boiler to the water back, and a pipe with two 45° ells carried high enough to clear the other pipes, thence up through hot air pipe and connected with bottom pipe of coil, which made the return pipe. At B another tee was inserted and carried up alongside of return pipe to top of coil, and connected with a reducer tee to coil. Here a ¼-inch pipe was attached and extended to bathtub, primarily as an air vent, but later developed into a luxury, as a tubful of hot water could be drawn in 15 minutes. On flow and return pipes globe valves were placed to cut off circulation when desired. From the accompanying plan it appears as though the connections were direct; such is, however, not the case. The coil stands parallel with the partition and was drawn thus to obviate the necessity of making another view, and there are eight angles and ells on both flow and return pipes. The result exceeded expectations as far as heating the two rooms was concerned, but in a family where considerable hot water is used it would not prove quite so satisfactory. A coil consisting of the same number of feet of ¾-inch pipe would have been a perfect job. I trust this experiment will be of some service to a brother chip.



Utilizing Surplus Heat.

Fire Place Smokes.

From THE MILLER GRATE COMPANY, *Cleveland, Ohio.*—We notice in *The Metal Worker* of May 12 a communication from "J. A. S," Fairfield, Iowa, in regard to a fire place which smokes. If "J. A. S." will fill the hollow space of back and sides to top of lower damper we think he will find the remedy for his smoking fire place.

Open or Closed Soil Pipes?

From M. C H., *Portland, Maine.*—I should like to have the opinions of the readers of *The Metal Worker* on covering soil pipe after it passes through the roof. Should the end be left open or covered with a wire basket or ventilator cap or cowl? It is my opinion that in this section all such devices would be stopped by a sleet storm and frozen up, effectually preventing vetilation. I have not seen any trouble where the end had been left entirely open.

Note.—The regulations in the city of New York require the end of the soil pipe to be protected by a screen. We suppose that the same practice is followed in other cities. It has been said that the open end of a soil pipe has been stopped by birds building nests in it. We shall be glad to have our readers give their opinions.

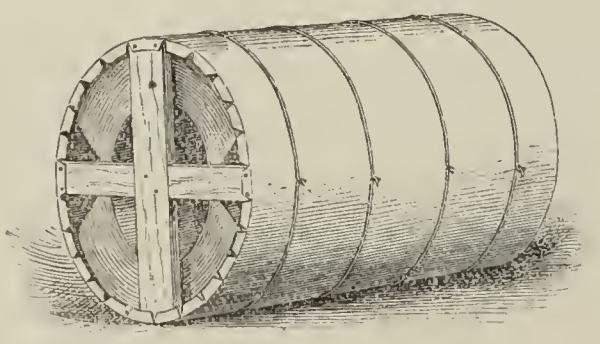
Sorting Information.

From N. G., *Tacoma, Wash.*—Having seen the letter of "C. E. S." in *The Metal Worker* of May 12, I send you my method of sorting information. In our shop all kinds of work is done, roofing, plumbing, steam and hot water heating and furnace work, consequently we need information on all sorts of subjects. I have made it a custom to clip the articles from *The Metal Worker* that are of practical value in our trade, and in order to have all of the clippings referring to one subject in one place I use large envelopes and have them labeled "Kitchen Boilers," "Plumbing," "Roofing," "Steam and Hot Water," "Pumps," "Plumbing Laws," "Furnace Work," "Pattern Cutting," "Tinner," "Gas and Gasfitter," "Stoves," "Chimneys" and "Electricity." After I have read the paper I cut out such articles as have interest to me or which I think will be of future benefit to me on any one of these subjects, and put them in the proper envelope. Then when I want to get some information on pumps or roofing I get the envelopes bearing these titles, and without the labor of searching through a number of

papers to get the right one, I have all the information before me. Each article clipped bears the date of the paper in which it appeared in red ink. I pursue the same course with advertisements and have accumulated an excellent business directory and a valuable collection of illustrations of articles that it would be impossible for any dealer to carry but which are often inquired for.

Proposed Package for Tin Plate.

From A. L. BURTIS, *Lockport, N. Y.*—Has any manufacturer or user of roofing tin any suggestions to offer for an improved package for shipping the plates? The last invoice of 20 x 28 came to hand all broken up, and almost always comes more or less dilapidated. Any one who has ever handled a quantity of it knows it to be a tough job and one to be dreaded. The boxes go by the name of "Bibles" on account of being something to swear by. Why cannot a cylindrical form of package be adopted in which two boxes of 20 x 28 could be packed and rolled about like a barrel? The cylinder may be of sheet iron, and could be used by the tinner for many purposes and might be charged for. We all know that it is



Proposed Package for Tin Plate.

a benefit to sheets of tin to be formed, and much of it is so treated to make it smooth. Although taking up a little more space as freight, I think the railroads would not charge much higher rates per hundred. The sketch that I inclose shows a form of package. It is merely a cylinder of sheet iron wrapped around with wire and the ends bent down, the tin plates being bent in half cylinders, leaving a hollow core. Across both ends of the package are strips of wood so placed as to prevent the sheets from slipping out. Very likely one strip would be sufficient, for I do not think the plates would have much tendency to slide out if closely packed. I would like to hear the opinions of readers of *The Metal Worker* on this system of packing tin plates, and would also be glad if some of the American manufacturers would give their ideas.

Wants a Better System.

From A READER, *Brooklyn.*—For the benefit of "W. S. G.," whose inquiry appeared in *The Metal Worker* of May 12, I give my idea of church heating. The hot air should be distributed and discharged into the church from a number of registers placed in the side walls at an elevation on a level with the eaves of the building. Ventilation for the building should be secured by air being drawn into registers placed at the base of the side walls. The capacity of the ventilating registers should be one-half that of the hot air registers. I should be glad to have the readers of *The Metal Worker* give their views upon this idea, as I consider that placing both the heating and ventilating registers on the floor, as shown on the diagram, is virtually connecting them together.

Paper Backed Corrugated Iron.

From CASWELL & MOORE, *Phœnixville, N. Y.*—Will some reader of *The Metal Worker* inform us whether any parties now manufacture corrugated iron with a covering of thick paper attached to it on the under side, and if so, where the material can be obtained? A sample was sent us several years ago, but has been mislaid or lost. The paper was pressed into the corrugations and adhered very firmly to the iron. We suppose the lining was for the purpose of preventing condensation or sweating.

By the reduction of the price of city made gas in Philadelphia from $1.50 to $1 per 1000 cubic feet, the receipts for the first four months of this year show a loss of revenue, as compared with the same period of 1893, amounting to $338,004. It is estimated that the city gas bureau realized a profit of $1,000,000 last year, but if the present ratio of consumption keeps up a deficit of about $100,000 will be exhibited at the end of 1894. The report of the chief of the Gas Bureau shows that although the price of gas was reduced 33⅓ per cent., consumption has only increased 18 per cent. This estimate, however, does not take into consideration the fact that the lower price will ultimately stimulate consumption much more. It is not reasonable to look for an immediate increase of any vast proportion, for only gradually will householders use gas more freely. The advantages of gas for heating and cooking will be admitted and the employment of gas stoves and ranges is sure to follow as soon as the price of the fuel renders their use economical.

Coxey's "popular" movement has come to an ignominious period by the consignment of the Commonweal leader and his principal lieutenants to jail in Washington on conviction of the offenses of displaying unlawful banners in the Capitol grounds and trampling on the grass. The whole episode has attracted far more attention than it merited.

The bill, promoted by the New York Academy of Medicine, providing for the establishment of a National Health Bureau has been favorably reported to the House by the Committee on Interstate and Foreign Commerce, and the measure has a good prospect of being passed into law by the present Congress.

A Canadian on American Tin Plate.

The *Canadian Manufacturer* of Toronto prints the following:

A few weeks ago the manager of a Toronto manufacturing concern, who are, perhaps, the largest consumers in Canada of tin plates, expressed a wish to have an opportunity of examining and testing some of the finer qualities of American tin plates. The gentleman to whom this wish was expressed happened to be a personal friend of one of the officers of the New Castle Steel & Tin Plate Company, who are proprietors of extensive tin plate works at New Castle, Pa., and in this way the wish of the Canadian consumer was made known to the American manufacturer. It was then that the New Castle Steel & Tin Plate Company addressed a letter to the Kemp Mfg. Company, Toronto, in which it was stated: "We have this day sent you a box of mixed plates—some ordinary coke, some sheets of a better grade of coke, and some of common charcoal. We would be pleased to have you inspect these plates and submit them to any test that you may require in your work. These are genuine American plates, made from Lake Superior ores, through our blast furnace, steel plant, and finished throughout in our works. We are furnishing these plates to some of the largest consumers in the United States, and thus far they seem to give the best satisfaction, as we have received nothing but praise in regard to the coating and working properties of the steel. . . . We make both a pure palm oil plate and a patent plate. The charcoal plates sent you are a pure palm oil finished plate. The cokes are made on patent machines. We are anxious to have you try our plates, and if at any time you desire high grade plates we would be pleased to quote you prices."

The writer was afforded an opportunity to inspect these American plates and was impressed with the most favorable comparison they bore to similar Welsh plates; and we have been informed by the Kemp Mfg. Company that they have been subjected to precisely the same processes of manufacture in their works as all other plates are, and that they are the equal in all respects of any plates ever used in that factory.

The Technical Education Board of the London County Council, England, are arranging a series of conferences during the coming summer between representatives of the various London industries. The object the board have in view is to elicit from practical artisans useful information as to what kind of trade education is required in each case, in what respects the existing provision is faulty, how it can be improved, and the best steps that can be taken to bring it to the notice of the younger workmen and apprentices.

The woolen carpet which has covered the coiners' room in the San Francisco mint for several years was recently cremated. On refining the ashes the Government recovered 279 ounces of gold, worth $5500.

The Chicago Stamping Company.

Recent additions have been made to the plant of the Chicago Stamping Company, rendering it a very much more complete establishment in every department. The works are now so extensive that they rank among the largest of the kind in the country. They occupy almost an entire city block, bounded by Congress, Green, Harrison and Peoria streets in the west division of the city of Chicago. This is graphically shown by reference to the accompanying diagram giving a ground plan of the works. The only portion of the block not included in the company's plant is the northwest corner.

These works were established by Frank Sturges & Co. in 1865. That firm erected a three-story building 100 by 30 feet on a portion of the present site. From this comparatively small beginning has gradually grown the important enterprise which is the subject of this article. The incorporation of the company dates from 1876. Frank Sturges, the founder of the company, still retains his connection with it. and is at present one of the board of directors. His son, Lee Sturges, became connected with the establishment in February, 1886, and is now president. Under his management the progress of the company has received increased impetus, judicious alterations have been made in the plant and its scope has been very greatly enlarged. W. M. Conger, now vice-president and secretary, was the late owner of the Newark Tea Tray Company of Newark, N. J., and first made the manufacture of high grade tea trays a success in this country. He was also the first inventor of machinery for successfully manufacturing stove boards.

The buildings erected on the block above referred to vary in hight from one to four stories. The main building of the factory is at Harrison and Peoria streets and is four stories high. The store building is diagonally opposite, on the corner of Congress and Green streets, and consists of four stories and a basement. The tin shops, stables, machine shops, stamping rooms, &c., occupy the intervening ground and are of irregular hight.

Until last year the company maintained a store on Lake street in the heart of the business section of Chicago, but at that time their new store building was finished and the offices were then removed to and consolidated with the works, greatly improving the shipping facilities, avoiding the frequent handling of goods, and enabling orders to be filled with much greater promptness.

The works may be said to be divided into two grand departments, of which one is devoted to house furnishing goods and the other to specialties, such as cans, grocers' goods, milk cans, milk can trimmings and stock.

The company manufacture their own raw material as far as possible. They have their own tin plate plant, in which they produce a large proportion of the tin plates required for their consumption. This department was started about the beginning of the present year, and now has three automatic tinning machines, to which more will soon be added. Contracts have already been placed for the additional machines, some of which are intended for tinning very large and heavy plates for milk cans. The capacity of the machines now in operation is from 800 to 1000 boxes per week. It is the intention of the company ultimately to not only make all the tin plates required for their own consumption, but also to manufacture for the open market. At present black plates are purchased from outside manufacturers, but the erection of a rolling mill at some convenient point is contemplated, and it would probably have been begun before this time if the question of tariff duties had been favorably settled.

The stamping department contains one of the largest presses in the world. Thus far only two of these large presses have been built. It is of the Stiles & Parker make, takes a 5-foot blank, weighs 65 tons and stands 18 feet high from the floor. It is used for very heavy work, pressing sheets up to the heaviest gauges. Other large drawing presses are in this department, which are used for dish pans and large work, together with a great number of small presses for cutting up tin plates for small ware and drawing all descriptions of small articles and miscellaneous work.

A peculiar feature of this establishment is that all the metal cutting for the works is done in one place, the stock then being distributed to the different departments in which it is finally worked up. In this way the cutting is economically done, insuring a minimum waste of tin plate. The importance of this feature will be realized when it is known that between 3000 and 4000 different articles are constantly in process of manufacture. The machine shop for making all the dies and special machinery is equipped with the latest kinds of planers, drills, lathes, &c. It is a complete die and tool shop, but is run exclusively on the company's own work.

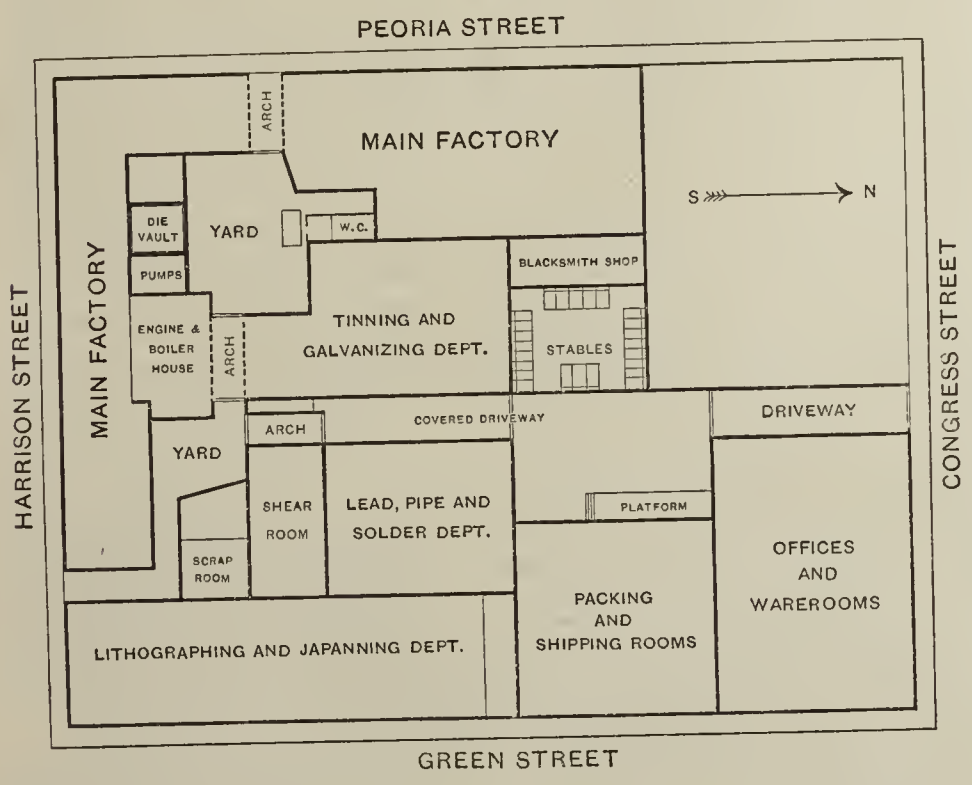
This concern was one of the first in the country to make stamped milk cans, and are now very prominent in the manufacture of milk cans and dairy supplies. They make a very great variety of milk cans, as each section of the country has its own peculiar pattern, and the company's business extends over the entire area. This department, which is under the management of W. H. Burn, formerly secretary of the Buhl Stamping Company of Detroit, is an important branch of the establishment, and is located on the ground floor of the main factory. Here milk cans are manufactured in large quantities for stock, so that the demand for made up cans can be promptly supplied. A large force of hands is also regularly employed in making up trimmings to supply the demand for this class of work.

The second, third and fourth floors of the main factory building are devoted to pieced tinware and can work, such as paint cans and miscellaneous tinware. The tinners' department for sheet iron and galvanized iron work and heavy tin work is also in this part of the establishment.

All stamped ware is retinned in a retinning shop operated in close connection with the tin plate department. It contains a number of stacks, additions to which are being made which will considerably increase its facilities. Retinning requires peculiar skill on the part of the workmen, and consequently the highest priced labor is found in this shop. An important department of the works is the galvanizing shop, which is also operated in connection with the tinning house. Galvanized ware, such as coal hods, buckets, &c., is first made of black iron and is galvanized afterward.

A special department is devoted to the manufacture of lead pipe and solder. It is equipped with the necessary machinery for manufacturing all sizes of lead pipe, from 4-inch down to ¼-inch. Here large quantities of solder are also made for the general trade. It is the intention to make the manufacture of lead pipe and solder more conspicuous hereafter.

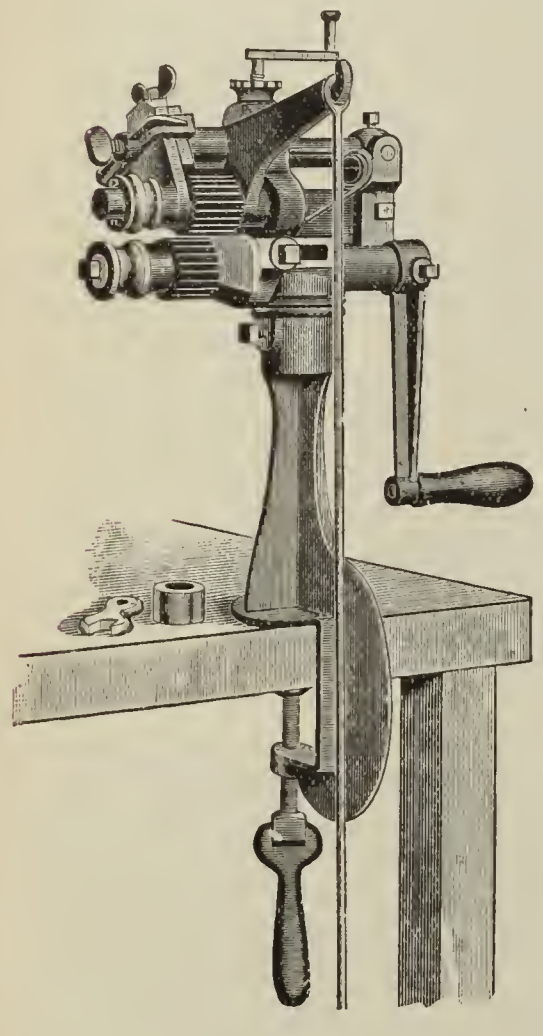
An extensive shop has been fitted up for lithographing tinware and japanned ware, including not only staple articles known to the trade, but a large amount of specialties, such as advertising signs, druggists' boxes, tea caddies, &c. Three power presses are constantly in operation on lithographic work. In close connection with the printing department is the japanning department, in which are a number of large baking ovens heated by steam. The company also have a nickel plating plant, in which they nickel plate all portions of their product requiring such treatment.



PLAN OF THE WORKS OF THE CHICAGO STAMPING COMPANY.

The line of house furnishing goods manufactured by the Chicago Stamping Company covers everything made by establishments of this kind. In addition, they turn out any kind of special work in sheet metal ware; for instance, they have an important trade in agricultural implement seats made of stamped metal, which are being used in place of the old style heavy cast iron seats. The special boxes made for the use of druggists and others are of infinite variety and sizes, some having been turned out as small as a nickel.

The store building has been well arranged for offices and warehouse purposes. The offices on the first floor are handsomely furnished. A portion of the same floor is used for a sample room. The store and sales department are under the management of W. L. Goodrich, who has been actively identified



The New Lightning Pipe Crimper.

with the tinware trade of the West for the last 25 years. The upper floors of this building are devoted to storage purposes, carrying at all times a full stock of kitchen and house furnishing goods. The company's trade covers the whole country from the Atlantic to the Pacific oceans and to the extreme South. They have built up a large Eastern as well as a Western trade. To meet the requirements of such a business and to hold the trade by prompt shipments, it is essential that very large stocks of goods should be constantly carried. Heretofore they have done a large jobbing business in connection with their business as manufacturers, but the rapid growth of their factory trade has now compelled them to discontinue the handling of outside goods and they will confine their attention almost exclusively to their own products.

The committee appointed by Secretary of the Navy Herbert to investigate the charges made against the Carnegie Steel Company, Limited, of furnishing the Government with defective armor plate finished their labors last week and have returned to Washington. It is given out that the proceedings of the sessions will not be made public, but will be incorporated in a report to be made to Secretary Herbert.

The New Lightning Pipe Crimper.

The New Lightning pipe crimper herewith represented is a machine brought out by the inventor, W. A. Wheeler of the Indianapolis Elbow Company, Indianapolis, Ind. This crimper is designed for general use in tin shops, as well as for factories where large quantities of stove pipe are made; rapidity of action and uniformity of work produced being the objects sought to be attained. A leading feature of the new crimper is the manner in which the rolls are brought to bear upon the work. This is accomplished, preferably, by means of a treadle connected with a lever, which, with the arrangement of the parts, gives to the upper rolls a swinging motion and brings them to bear upon the work with a toggle joint movement, thus holding it very rigidly with little or no pressure on the treadle, as the forward movement of the crank in drawing the work through serves to hold the rolls down, relieving the operator of any special effort as to this part of the work. As a matter of fact, if the foot be removed from the treadle after starting the work in it goes through all the same. A slight backward movement of the crank instantly releases the work. This toggle movement, it is pointed out, also acts as a safeguard against any slighting of work by a careless hand, as the depth of crimp does not depend upon the treadle pressure, being regulated entirely by the crank screw at top, which is secured from working loose by means of a lock nut. If desired, this machine may be closed and opened by means of the screw, the change being effected in an instant and without in any manner impairing its efficiency. To effect this the lever is brought down as far as possible and then a pin (not shown in cut) is pushed in which prevents the rolls from swinging, but allows them to rise and fall vertically with the movement of the screw. This feature will be appreciated where odd jobs are to be done, but for turning out work in quantities the treadle will be found preferable. The upper swedging roll is attached to a separate head block which is secured to the swinging frame by means of a clamp made fast by a thumb screw, as shown in the cut. Another thumb screw above this head block furnishes means for adjusting the swedge to different depths without affecting the crimp. The head block is readily removed by loosening the clamp and slipping it off when it is desired to leave the swedge off the work; or the same result may be accomplished quicker by pulling out the spring pin that holds the roll on and then slipping it off. The rolls are made of the best cast steel and hardened and are machine finished all over. They can be interchanged when worn out at one end. A new pattern of screw clamp stand is furnished with each machine, which is both light and strong.

One of the results of the soft coal strike is that the largest fleet of idle vessels ever seen on the Delaware now floats there awaiting the termination of the trouble—and cargoes.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE W. H. KEELER COMPANY have secured the plumbing and tinning contract on a six-tenement house on South Elm street, Waterbury, Conn.

JOHN J. RULOFFS & BRO. received the contract for the plumbing work and E. P. Bates of Syracuse the contract for the steam heating in the city building at Albany, N. Y.

THE BOARD OF EDUCATION of Minneapolis have awarded the contract for the new Douglas School building to Eric Lunn for $29,295. This does not include the cost of heating and ventilating plant or the system of plumbing for the school, which will be contracted for later.

A SPECIAL COMMITTEE, composed of Messrs. Ulrich, Brady and Holthaus, has been appointed by the School Board of St. Louis to take charge of the repairs and changes to be made to the heating apparatus in the schools, which has been estimated to cost nearly $40,000, and which will include substituting hot air furnaces for stoves and steam heaters for furnaces, according to the schools. In many of the schools simple repairs are required.

THE COUNCIL of La Crosse, Wis., have authorized the Board of Public Works to advertise for bids for a heating plant for the Logan Street School.

H. E. BOTTUM has been awarded the contract for the plumbing in the new *Republican* Building, at Cohoes, N. Y.

AMONG the contracts recently taken by the Baker & Smith Company, 193 to 197 Van Buren street, Chicago, can be mentioned the following: Hot water heating plant in the residence of Gen. C. W. Drew, Calumet avenue, and steam heating plant in the residence of David B. Jones, Lake Forest, Ill.

THE WELLS & NEWTON COMPANY, 274 Dearborn street, Chicago, do the plumbing, sewerage and gas fitting in the flat building of J. L. Wells, 425 Marshfield avenue.

THE WALCOTT-HURLBUT COMPANY, 175 Lake street, Chicago, are to furnish two sections of their Eduction siphon closet range for the United States Indian School at Phœnix, Ariz., and two sections for the Meriden Britannia Company, Meriden, Conn.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, are to furnish the steam heating plants for the residence of Leon Mandel, Michigan avenue and Thirty-fourth street, and for the C. & N. W. R. R. depot at Marshalltown, Iowa.

YARRINGTON & MCCABE have the contract for the plumbing at the power house of the Derby Street Railroad Company, at Derby, Conn., and have commenced to put in the waste pipes.

THE BOARD OF EDUCATION OF SOMERVILLE, N. J., have authorized the architect of the new school building to advertise for bids for the heating and ventilation of the school. The building will also have a complete system of plumbing.

GEORGE B. COBB & Co., 96 Centre street, New York, are engaged in installing Florida boilers in the residence of George L. Aiken, Rahway, N. J.; G E. Corry, Bensonhurst, L. I.; F. G. B.

Brown, Keyport, N. J., and H. L. Ward, Tottenville, Staten Island.

ARCHITECT JAMES A. HISCOX is making plans for the addition and sanitary improvements to the Roath Avenue School, Norwich, Conn.

A PLUMBING CONTRACT amounting to $45,000 for Cornelius Vanderbilt's summer residence called The Breakers, at Newport, R. I., was awarded to William Lumb & Co., of Boston, Mass.

THE COUNCIL COMMITTEE on the new industrial school at Newport, R. I., have adopted specifications for the plumbing of the new building and have authorized the architect to ask for bids for the steam heating from local steam fitters.

TRAYNOR & Co., Wilmington, Del., have the contract for installing the steam heating plant in the St. Joseph Home of Colored Missions of that city. There are five buildings, including a church, priests' house, sisters' house, the orphanage and a general utility building. Two heavy duty Florida boilers will be used and 7400 feet of the American Radiator Company's radiators. The steam main in starting from the plant is 8 inches in diameter, and it is 390 feet from the boiler to the extreme end of the main, the entire circuit being nearly 800 feet.

THE WELLS & NEWTON COMPANY of New York City are engaged in installing the steam heating plant in the addition to the Drew Seminary, at Madison, N. J., where they are using Joy radiators. They are also commencing the installation of the heating plant in St. Luke's Hospital, New York City.

THE SMITH & ANTHONY COMPANY of Boston, Mass., will furnish the heating and ventilating apparatus for the new school building at Burlington, Vt., which will be installed by the G. S. Blodgett Company of that city.

CHARLES R. WATKINS, clerk of the Board of Supervisors of Watkins, N. Y., will receive sealed proposals up to June 2 for the steam heating plant of the county building and the plumbing for the court house at that city.

THE CONTRACT for furnishing the hot water heating system for the county house has been awarded Sullivan & Haynes, Middleburg, N. Y., for $1302.50.

J. S. BRAZELTON of the firm of J. S. Brazelton & Co., plumbers, Waco, Texas, has been in Belton taking the measurements for the plumbing work in the new hotel that is in course of construction at that place.

THE IOWA CONSTRUCTION & MFG. COMPANY of Sioux City, Iowa, were awarded the contract for furnishing and placing the heating and ventilating apparatus, including elevator power, for the public building in course of construction at Paris, Texas. The amount of the contract is $5500.

E. T. WEYMOUTH, Brooklyn, has recently completed the installation of a steam heating plant in the residence of A. E. Schwartzman of *Puck*, at Nostrand and St. Mark's avenues, Brooklyn, N. Y., using a No. 30 All Right steam boiler.

THE S. WILKS MFG. COMPANY, 113 to 123 Clinton street, Chicago, are to furnish large sized Wilks hot water heaters and tanks for the Indian Agency at Standing Rock, N. Dak.; residence of James W. Willard, Waterbury, Conn.; G. N. Buffington Bath House, Buffington, Ky., and residence of A. W. Green, 4935 Greenwood avenue, Chicago. The company have received a large number of orders for small heaters from various parts of the country, and report business to be in a flourishing condition.

MEISEL, STICKNEY & Co., 43 College place, New York, are installing five All Right steam boilers in the buildings being erected by Jenkins Brothers at 121st street and Eighth avenue.

SCRAP.

THE WORKS of the Cynon Tin Plate Company, Aberdare, have been lately added to the lengthening list of closed Welsh tin plate establishments.

NOTWITHSTANDING the continued stoppage of a large proportion of the Welsh tin plate works, owing to the refusal of the workmen to make more than 36 boxes per shift, the production of tin plates is reported as being still far in excess of shipments, which have reached a very low figure.

KAHN BROS'. tin plate plant, at 525 East Nineteenth street, New York City, is quite busy turning out the firm's brands of American terne plates to fill orders. Messrs. Kahn report a very active demand for roofing plates at the present time, the domestic product being in special request. For a while the operations of the firm were somewhat hampered, owing to the difficulty of obtaining a sufficient supply of American black sheets, which they use exclusively, but this impediment has been overcome.

LAST WEEK executions amounting to $8477 were issued against the McKinley Tin Plate Company of Wilkinsburg, Pa. The concern were chartered on June 8, 1892, with a capital stock of $50,000. The charter members of the company are: L. H. Smith, 240 shares; E. S. Wangenheim, 240 shares; H. Y. Haus, 2 shares; S. W. Cunningham, 2 shares; Richard B. Scandritt, 2 shares. Since the organization some Pittsburgh parties have also taken stock. The firm have not as yet made an assignment, but judgment has been confessed to E S. Wangenheim, one of the largest stockholders, in order to protect the company and their creditors. The assets are placed at $15,000 and the liabilities at about the same amount.

THE TIN PLATE DEPARTMENT now under erection by the Ætna Standard Iron & Steel Company, Bridgeport, Ohio, is expected to be ready for operation about June 1 next.

Two new tin plate manufacturing companies were registered in England lately — namely, the Earlswood Tin Plate Company, Limited, with a capital of $60,000, and the Foxhole Tin Plate Company, Limited, with $100,000 capital, both of Llansamlet, Glamorganshire, Wales. Commenting on this circumstance, the *Iron and Steel Trades Journal* of London says, editorially: "For the moment there is no inducement for any one to invest in tin plate works, but there is a good time coming, and the Welshmen are getting ready for this."

THE CITIZENS of Anderson, Ind., are reported as endeavoring to arrange for the location there of a rolling mill to manufacture black plates for tinning.

THE EMLYN STEEL & TIN PLATE COMPANY, Summitville, Ind., are reported to be progressing satisfactorily with the buildings for their tin plate plant, which will, when complete, have a capacity of 150,000 boxes annually.

THE NEW CASTLE STEEL & TIN PLATE COMPANY, New Castle, Pa., have contracted with Maris & Beekley of Philadelphia for the supply of a 4 ton traveling crane and two 2-ton trolleys.

THE LEECHBURG FOUNDRY & MACHINE COMPANY, Leechburg, Pa., have made the first shipment of tin plate machinery to the Ætna Standard Iron & Steel Company, Bridgeport, Ohio, consisting of cold rolling mills, hot rolls, shear, pickling machine, &c.

AN ATTRACTIVE little advertising novelty is being distributed by the well-known tin plate house of Merchant & Co., Incorporated, of Philadelphia, New York, Chicago and Brooklyn. It takes the form of a folded card, bearing a faithful resemblance to a miniature box of their famous brand of terne plates—Merchant's Roofing—with all the proper markings of the original. On opening the card an excellent representation of a silvery roofing plate is seen reposing within the box, having a *fac simile* of the firm's registered brand stamped on its face.

ONE OF THE YOUNGEST on the list of American tin plate works is that of George W. Jaques, Thirteenth avenue and Twentieth street, New York City. Two tinning stacks constitute the present equipment, but these are likely to be added to before long, as they have been kept actively engaged to their full capacity ever since starting two months ago. Mr. Jaques uses American black sheets exclusively, and his product has met with so favorable a reception among the local trade that he has received orders for all of his output for some time to come. "New Process" roofing plates are his specialty at present. Mr. Jaques was for a long period connected with the old established tin plate and metal firm of A. A. Thomson & Co. of this city, and is well known by the tin plate trade.

The Tin Plate Duty.

On Thursday, in the Senate debate on the Tariff bill, the amendment reported by the Finance Committee reducing the duty on tin plates from 1⅛ cents a pound (as arranged in the House bill) to 1 cent a pound was withdrawn, leaving the House rate standing. Senator Aldrich of Rhode Island moved an amendment to make the rate 1⅛ cents a pound, and was supported by Senators Platt and Allison, the latter arguing that the reduction of the duty on tin plates involved a breach of fai h toward those manufacturers who, under the inducements offered by the McKinley bill, had established a successful and promising native industry. Works, he said, had been erected, with a capitalization of nearly $6,000,000, producing 100,000,000 pounds of tin plates per year, and which would have been now producing double that amount were it not for apprehension caused by tariff agitation. The reduction of duty, he asserted, would give a severe blow to the nascent industry. After a lively discussion the amendment of Senator Aldrich was defeated, and the paragraph fixing the duty at 1⅛ cents per pound was agreed to.

The Pittsburgh Fuel Company are reported to have contracted for mining machines to operate their coal pits as a result of the miners' strike.

ROOFING AND CORNICE.

The Country Cornice Shop.

IX.

BY CORNICE WORKER.

Leader Hooks and Coverings.

In Fig. 85 is shown a hook which is used for fastening plain leader to a wall, the blows being struck against A when driving the hook in place.



Fig. 85.—Plain Leader Hook.

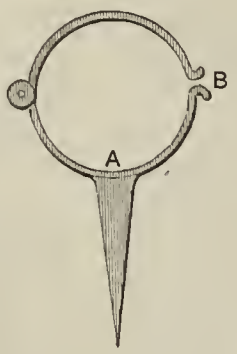


Fig. 86.—Plain Hinged Leader Hook.

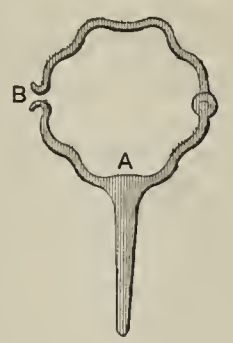


Fig. 87.—Corrugated Hinged Leader Hook.

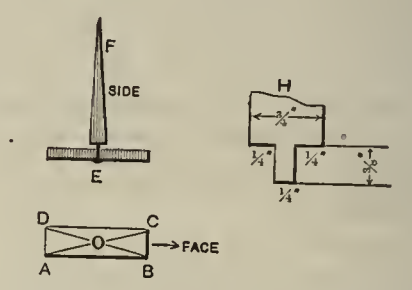


Fig. 90.—Side and Face Views of a Home Made Leader Hook.



Fig. 88. — Wall Hook for a Square Leader.

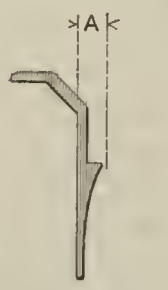


Fig. 89.—Wall Hook for an Octagon Leader.

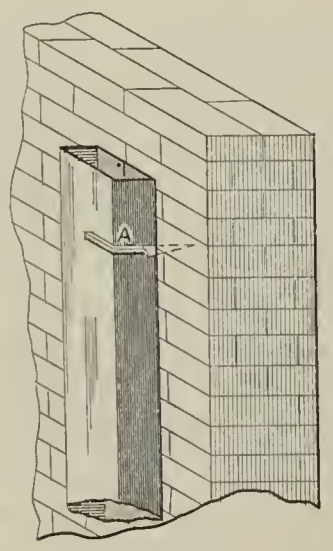


Fig. 91.—Square Pipe Fastened Against a Wall with Hook Shown in Fig. 88.

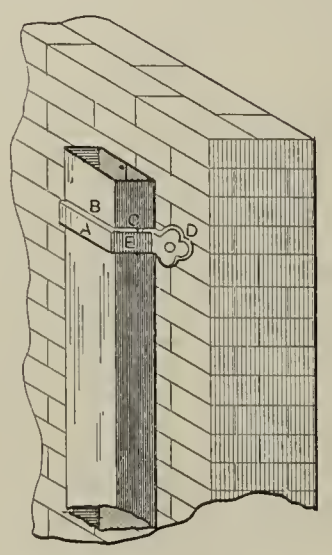


Fig. 92.—Method of Covering the Hook with Metal.

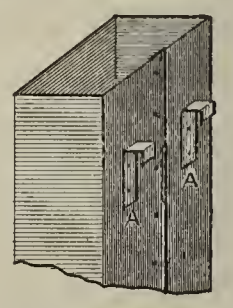


Fig. 93.—Method of Soldering or Riveting the Angles on Leaders.

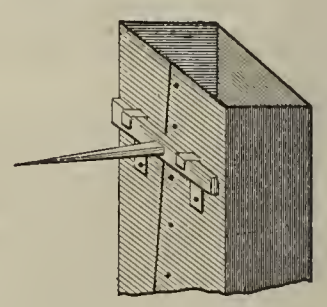


Fig. 94.—Angles Resting on the Hook Shown in Fig. 90.

THE COUNTRY CORNICE SHOP.—ILLUSTRATING LEADER HOOKS AND COVERINGS.

Fig. 86 represents a hinged leader hook, used for putting up plain leaders when it is desired that the leader stand off from the wall, so that in case of an overflow or the leader bursts the wall will not be injured.

When driving the hook into the wall it is opened and the blow struck against that portion indicated by A of Fig. 86.

In using hinged leader hooks they must first be driven into the wall before the leader can be placed in its proper position; but in using the hook shown in Fig. 85 the leader is first placed in position against the wall and then the hook driven over it.

Let us suppose that a straight plain leader is to be put up, having no bends whatever, and that hinged hooks as shown in Fig. 86 are to be used. After having marked the position where the leader is to be placed, drive the first top hook as far as the leader is to project from the wall. Now drop a chalk line with a weight attached at the bottom so as to keep it stretched, fastening the line to the center of the hook A shown in Fig. 86. Now drive as many hooks as are required, being careful that the chalk line meets the center A of the hook, Fig. 86. The leader is now placed in the hooks, the hinges closed and fastened with wire at B, using a pair of plyers with which to twist the wire. By using hinged hooks a great amount of time and labor is saved in case of repairing, or if a new leader was required the wire and hinge would simply be opened, the old leader removed and the new one put in place. The hinges would then be closed and fastened with new wire.

Fig. 87 represents a hinged hook for corrugated leader; the same method being employed to fasten the hook and leader as explained for that shown in Fig. 86. In Fig. 88 is represented a wall hook used for a square leader, the same as would be employed to fasten such a leader as that shown in Fig. 91.

In Fig. 89 is represented a wall hook for fastening an octagon leader in the same manner as shown in Fig. 91. The hooks indicated in Figs. 85, 86, 87, 88 and 89 can be purchased from dealers in tinners' supplies, from whom catalogues can probably be obtained upon application.

In Fig. 90 is shown the side and face view of a home made leader hook; A, B, C, D representing the face view, E, F the side view, and H the measurements from which to cut the wedge F, so as to rivet on to the face as shown at

E. The face or front of the hook, A, B, C, D, Fig. 90, is made from a piece of $\frac{3}{16}$ x 1 inch band iron, making the length of A B or C D, Fig. 90, in length equal to the width of the square or octagon leader, which is to lay against the hook, as shown in Fig. 94.

After the piece of band iron is cut to the required length, draw two diagonal lines through the same, as shown from A to C and B to D in Fig. 90, the intersection being shown at O. This indicates the center where the $\frac{1}{4}$-inch hole is to be punched, in which to place and rivet the wedge, as shown at E, Fig. 90. The wedge F, Fig. 90, can be made from $\frac{1}{4}$ x $\frac{3}{4}$ inch band iron. Heat the end F in the forge to almost a white heat, and then with quick successive blows with the hammer, stretch it to almost a point, wedge shape, as shown. Three inches of the wedge driven into the wall will be sufficient to uphold the leader. Now if the leader is to project 2 inches over the wall line, and 3 inches are required to drive into the wall, then the wedge must be cut 5 inches in length. The rivet end of the wedge, shown at E, Fig. 90, is cut and filed as shown at H, Fig. 90, the full size measurements being given.

The $\frac{1}{4}$ x $\frac{3}{8}$ inch rivet shown at H must be filed perfectly round so as to fit the $\frac{1}{4}$-inch round hole punched in the face of the hook, shown at O, Fig. 90, and to which it will be riveted as shown at E, Fig. 90. After it is riveted the rivet head E should not project over the face of the hook any more than $\frac{1}{8}$-inch, so that the leader will lay well against it. In driving the hooks into the wall care must be taken that they are all on a plumb line, using the chalk line as before explained, and that each hook has the same projection over the wall as the other, otherwise the leader will not lay tight against the hooks.

In Fig. 91 is shown a perspective view of a square pipe, or leader, fastened against a wall by means of the hook shown in Fig. 88. It will be noticed that the riveted side of the square leader shown in Fig. 91 lays tight against the wall and that the hook A of the figure corresponds to the hook A of Fig. 88, and is driven into the joint of the brick work as shown in Fig. 91. If the hook was left in this position it would make a bad appearance; to overcome which a galvanized sheet metal covering is placed over the hook, using galvanized iron for a galvanized iron leader and copper covering for a copper leader. The appearance is shown at A in Fig. 92. The covering A in Fig. 92 is slipped over the hook shown at A in Fig. 91 and soldered along the top of the covering and against the leader, as shown at B and C, Fig. 92, thus making a clean and neat appearance.

In Fig. 93 is a perspective view of a square leader, showing the method of soldering or riveting to the leader the angles for fastening the pipe or leader which is used in connection with the home made leader hook in Fig. 90. These angles can be made about $1\frac{1}{2}$ inches wide and so long that two rivets can be riveted through the leader and angle with ease. If it is not convenient to rivet the angles they can be well soaked with solder, which also gives a good hold. The hooks on these angles should be made a little larger than the size of the face of the leader hook shown in Fig. 90, which is $\frac{3}{16}$ x 1 inch in size. When making the angles use about No. 14 gauge iron. In Fig. 94 is shown a perspective view of the leader and angle resting or hanging on the hook after the latter has been driven into the wall. These hooks can also be used for round leaders of any size by simply bending the face of the hook shown in Fig. 90 to the required circle. It is usual to place these hooks about 8 feet apart, being careful about having them on a plumb line, as before explained, and then taking a long wooden rod about $1\frac{1}{2}$ x $1\frac{1}{2}$ inches by 15 to 18 feet in length and laying it against the hooks driven in the wall, mark off the hooks on the rod, then transferring these distances to the leader, solder or rivet on the angles shown in Figs. 93 and 94. In putting up leaders with the use of these home made hooks a little more time may be required, but when the job is completed the leader gives a neat appearance because no hooks or bands are exposed to view. In putting up any kind of leaders or hooks the latter are generally driven into the wall by reaching out of the windows. Sometimes the leader is placed where the windows are too far distant and then a sitting scaffold must be used, a device which will be found very convenient when executing such a job.

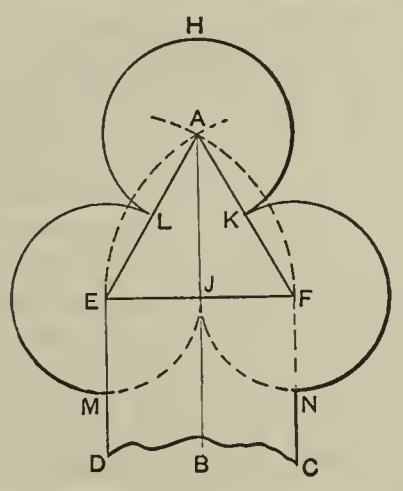


Fig. 95.—Method of Obtaining the Geometrical Figure or Leaf Shown at D in Fig. 92.

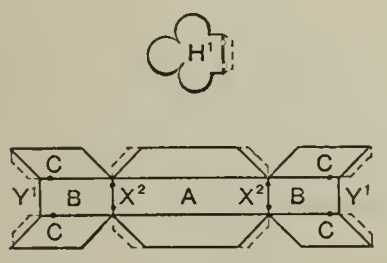


Fig. 97.—Joining in One Piece the Pattern for Front and Sides of Covering; also Pattern for Leaf.

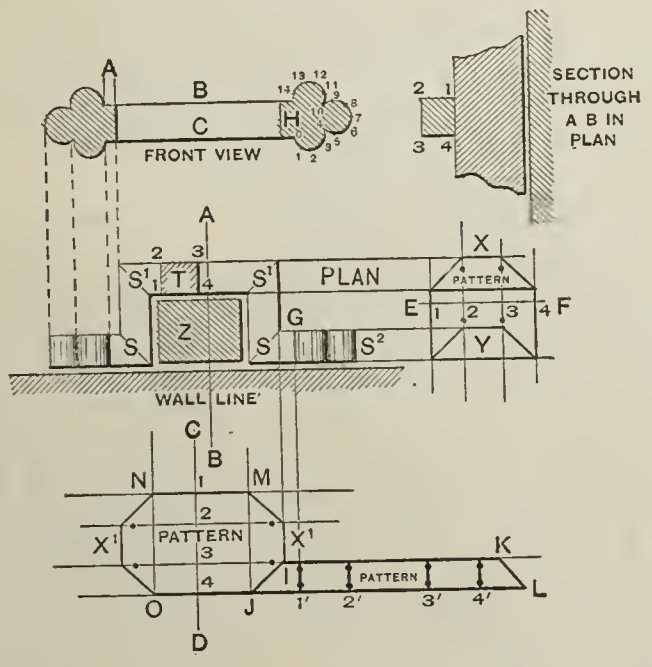


Fig. 96.—Front, Plan and Sectional Views of Hook Covering; also the Patterns.

Patterns for Coverings.

In Fig. 95 is shown the method of obtaining the geometrical figure or leaf for the sheet metal covering as indicated at D, Fig. 92. To obtain the leaf proceed as follows: Draw any perpendicular line, as A B, Fig. 95, upon either side of which place the half distance of the width the covering A, Fig. 92, is to have, as shown by the line E F, drawn at right angles to A B, in Fig. 95. Now upon this line construct an equilateral triangle, or a triangle having three sides equal. With F, Fig. 95, as center and F E as radius strike and arc as shown from E to A; then with E as center and E F as radius strike another arc, intersecting the first one at A. Now draw a line from A to E and from A to F; then will A E F represent the triangle desired. It will be noticed that the line A B, Fig. 95, bisects the line E F at J. Now with F as the center point for the compass and with F J as radius strike an arc, cutting the line A F at K; then with A as center and with the same radius strike another arc, cutting the line A E at L. Then again with E as center and using the same radius strike an arc from the point L, meeting the point J on the line E F. Now at right angles to E F, or parallel to A B, drop lines as shown from E to D and F to C. The distance N to C, or M to D, can be made to the width desired, as indicated at A, front view, Fig. 96. Then will C N H M D represent the leaf desired. It should be understood that the width of the covering shown from E to F in Fig. 95 gives the basis for obtaining the center point from

THE COUNTRY CORNICE SHOP.—ILLUSTRATING LEADER HOOKS AND COVERINGS.

which to strike the arcs, and therefore makes the leaf in proportion to the width of the covering.

In Fig. 96 is shown the front, plan and sectional views of a hook covering, including the patterns. Let Z in plan represent the size of the leader used, laying against the wall, as shown, around which is placed the plan view of the covering. The width of the front view of covering shown from B to C should be made from 1 to 1½ inches, according to the size of the pipe used: while the width shown from 1 to 2 or 3 to 4 in plan, or what is the same, the width from 1 to 2 or 3 to 4 in the section, should be made a little wider than the width of the hooks shown at A, Fig. 88, or A, Fig. 89, so that the covering will slip over easily. After having the front and plan views drawn in their proper position to each other, as shown by the dotted lines, draw a section of the covering in the plan, as shown at T, from which to obtain the stretchout. S, S′, S′, S represent the four miter lines in plan. To obtain the patterns for the coverings proceed as follows: At right angles to the line S′ S′ in plan, draw the stretchout C D, as shown, upon which place the stretchout of the section T in plan, as shown by the small figures 1, 2, 3 and 4, corresponding in number to those on the section. Now at right angles to the stretchout C D draw lines indefinitely through the small figures, as shown, which intersect with lines of corresponding numbers drawn from the miter lines S′ and S′, parallel to C D. A line traced through these intersections will be the required pattern for the front of the covering shown at A, Fig. 92. For the pattern of the side of the covering, shown at E, Fig. 92, proceed as follows: Parallel with the line S′ S′, Fig. 96, draw the stretchout E F, upon which place the stretchout of the section T of the plan view, as shown by the small figures 1, 2, 3 and 4 on the stretchout line E F. At right angles to the stretchout draw lines indefinitely through the small numbers, as shown, which intersect with lines drawn at right angles to the line S′ S, from the miter lines S′ and S. A line drawn through these intersections will be the required pattern for the two sides of the covering, as shown at E in Fig. 92. The pattern for the front and sides of the covering can be made in one piece if desired. In Fig. 97 let A represent a duplicate of the pattern of the front, as shown by M N O J, Fig. 96, and B B, in Fig. 97, represent duplicates of the pattern of the side shown by X E Y F, Fig. 96. It will be noticed that X of the pattern for the side in Fig. 96 joins X′ and X′ on either side of the pattern for the front in Fig. 96, the joining being shown at X^2 X^2, Fig. 97. Then will B A B, Fig. 97, be the desired pattern for the front and two sides of the covering. Laps are allowed as shown by the dotted lines in Fig. 97. For the pattern of the strip which bounds the leaf H, front view, Fig. 96, proceed as follows: At right angles to C D of the pattern, Fig. 96, draw the lines 3 and 4 indefinitely to the right, as shown by 3 K and 4 L. It should be understood that the width 3 4 of the pattern on the line C D, Fig. 96, is the same as the width 3 4 of the section, and is the width of the strip which bounds the figure H in front view, as shown by S S^2 in plan view. From the bend G in plan view, which corresponds to the angle 1 and 14 of the leaf H in front view, drop a perpendicular line cutting the lines I K and J L, as shown at 1′ of the pattern. Now space the leaf H, front view, Fig. 96, into an equal number of parts, as shown by the small figures from 0 to 14; transfer the spaces with the dividers from 0 to 4, front view, on the lines I K and J L, from 1′ to 2′. Now transfer the spaces from 4 to 10, front view, to the pattern, as shown from 2′ to 3′; then again transfer the spaces from 10 to 14, front view, to the pattern, as shown from 3′ to 4′. Now place a duplicate of the miter 1′ J I, Fig. 96, as shown, at 4′, L and K, which completes the pattern. Then will I J L K, be the pattern for the strip bounding the leaf H, front view, Fig. 96. The miter I J will be cut away from the pattern of the front, as shown. The leaf H′, shown in Fig. 97, is a duplicate of the leaf H, front view, Fig. 96. A lap is allowed at H′, Fig. 97, which is bent at right angles and soldered to Y′ Y′, Fig. 97.

Bending the Covering.

If a bar folder is at hand, the pattern shown in Fig. 97 could be bent upon the two lines C C and C C, after which the cross bends could be bent by hand as shown by X^2 X^2, Fig 97, and soldered to their required angles. If a folder is not at hand the pattern B A B, including the leaf H′, Fig. 97, and the strip for the leaf shown by I J L K in Fig. 96, could be bent upon the hatchet stake previously shown in Fig. 6.

FLASHINGS.

A FRENCH CONSUL in Burmah, in a recent report to his Government, states that galvanized iron is coming into use in the buildings of the country to a marked extent. Only a few years ago, he says, all the native houses, rich and poor alike, were built entirely of wood and roofed in with grass or leaves. The low price at which iron can be had nowadays has encouraged the Burmese to use it more and more in the construction of their shops, barns, or outhouses. Thus galvanized and corrugated sheet iron is now in general use for roofing purposes, while nails and metal bolts are being substituted for wooden pegs and plugs. These goods are consequently in steady and growing demand.

RHODES, DICKELMAN & Co., Forest, Ohio, report that they are meeting with far greater success with their new eave trough and hangers than their most sanguine expectations, having within the past 90 days established agencies very broadly, and at the present time have in addition placed their goods in over 15 States with the largest jobbing houses, who speak of their merits in the highest terms.

JOHN LE SAUVAGE has recently moved to 37 Duane street, New York, where he has fitted up a shop and is prepared to do all sorts of tin, copper and sheet iron work. He makes a specialty of remedying defective flues, a character of work with which he has had a large experience that has brought him a number of recommendations.

Frank Steele, Charles Gifford and George W. Nelson of Oriskany, N. Y., discovered a few days since in the Mohawk River, opposite the old Oriskany battle ground, two solid round cannon balls in about 3 feet of water, imbedded in the clay. The balls weighed originally 30 pounds, as they weigh 29¾ now. The portion imbedded in the clay is in an almost perfect state of preservation, while about one-third of the surface is considerably corroded by the action of the water. It is calculated that the balls had been there over 117 years, as the battle was fought August 7, 1777.

Trade Notes.

MANY OF OUR READERS and all of our advertisers will be interested in the announcement elsewhere in this issue of A. Mugford, Hartford, Conn., who is a well-known engraver and electrotyper. He makes a specialty of doing work for the heating trades, and as the brief list of references in his advertisement shows, does work for many large and well-known concerns. He has had long experience in designing and engraving advertising matter especially adapted to the trades represented by *The Metal Worker*.

THE TINNERS' MACHINERY & SUPPLY COMPANY, 9 Cliff street, New York, issue a card giving net price-list of Skylight Gearing, a stock of which they carry on hand ready for shipping. On the back of the card are illustrations of the different parts of the Gearing.

TIN ELBOWS AND ANGLES are advertised in this issue by the Excelsior Steel Furnace Company, 38 West Monroe street, Chicago. They make three and four piece Elbows and Angles of 22½° and 45°, in any size from 7 to 20 inches. Those who have not yet used the company's goods can save $1 on their first order for $10 worth or more by cutting out the coupon which appears as part of the advertisement.

THE ADVERTISEMENT elsewhere of the Griswold Mfg. Company, Erie, Pa., directs attention to the Erie Aluminum Ware of their manufacture. The various advantages of this ware are pointed out and particular attention is directed to the Erie Aluminum Kettle, made from cast metal and used for preserving. Fruit acids will not affect it and it is noted in addition that there is no enamel to flake off or plating to wear.

THE DONOHUE PATENT SOLDERING COPPER HANDLE is the subject of an announcement of the Cleveland Rule & Handle Company of Cleveland, Ohio. An illustration of the Handle is shown and general description presented; also a list of firms handling it.

GEORGE BROTHERS, agents for Acorn stoves and ranges at Chaumont, N. Y., report having received the first premium on their display of Ranges at the Watertown, N. Y., fair held recently.

THE ANNUAL MEETING of the John Torrey Mfg. Company was held at the office in Portsmouth, N. H., May 14, and the old officers re-elected. The business of the past year was reported as satisfactory and the sale of Stovene, a paste stove polish, which is the leading specialty of the company, now extends to every State and Territory in the Union. Besides Stovene a paste shoe blacking and a liquid dressing for shoes are manufactured. During the past year the company have removed their plant from South Newmarket, N. H., to Portsmouth, N. H., where they occupy a large factory and have at their command every appliance for the production of the articles above named.

THE STANDARD RADIATOR COMPANY, Buffalo, N. Y., and 167 to 169 Lake street, Chicago, have received orders for over 25,000 feet of radiation from the Modern Heating Company, American Heating Compsny, Boyce & Co., and Ring & Reardon, St. Louis.

PLUMBING and GAS FITTING.

Plumbers' Convention Delegates.

The master plumbers' associations all through the country are electing delegates to the Twelfth Annual Convention of the National Association of Master Plumbers to be held at Detroit June 19-21. The delegates that will be sent from Pittsburgh were given in *The Metal Worker* May 5; from Rochester, N. Y., and New York City May 12; from Texas, Massachusetts, Baltimore and Philadelphia May 19. Some of the other States and cities will be represented, as follows:

BOSTON, MASS.

J. Warren French, J. W. Cosden, David Smith, J. F. Davlin, Dan'l Shannon, T. E. Sharp, P. H. Winn, E C. Kelly, D. G. Finnerty, J. C. McCool, T. J. Hartnett, Isaac Riley, H. H. Collins, Wm. A. Tucker, Jno. Crawford, Jno. C. Boyd.

NEWARK, N. J.

Elias Berla, Alex. Donn.

ST. LOUIS, MO.

P. Madden, Wm. Mortimer, E. J. Lonergan, E. P. Reardon, Jas. McCartin, John McMahon, Ed. Schceneman, A. J. Gallagher, J. C. Mitchell, D. J. Collins, Jeremiah Sheehan, Jas. Kelly, John Shelly, Wm. F. Stein, J. M. Life, Ed. Gardner, C. H. Carroll, Ed. Zausch.

NEW HAMPSHIRE.

F. Lane, Manchester; E. Lessard, Manchester; P. Clifford, Concord.

NEW YORK STATE ASSOCIATION.

W. J. McDermott, Chas. Geiger, J. A. Rossman.

RHODE ISLAND.

D. L. Fales, Pawtucket; Samuel Jackson, Pawtucket; Joseph Haire, J. Cremin, Newport.

WASHINOTON, D. C.

Jos. R. Quinter, Edw. J. Hannan, Jas. Ragan, Dan'l Hannan, Jas. Nolan, Jas. Cunningham.

TOLEDO, OHIO.

Jno. A. Waite, Jno. E. Shultz, Jno. P. Lawrence, Robt. Raitz.

BRIDGEPORT, CONN.

Thomas Logan, president; L. H. Mills, H. B. Middlebrook, James Cook and Geo. E. Schofield, alternates.

WILMINGTON, DEL.

James F. Traynor and Alfred Gawthrop.

IOWA STATE ASSOCIATION.

J. A. Harris, Sioux City; J. E. Allen, Des Moines; J. Burnside, Des Moines.

MILWAUKEE, WIS.

Chas. Polacheck, W. E. Goodman, Ferd. Wittig, W. H. Halsey, A. R. Schwind, Ed. Grassler, L. H. Plum.

CONNECTICUT STATE ASSOCIATION.

Jas. Ahern, Hartford; S. E. Dibble, New Haven; J. Donovan, Middletown.

KANSAS STATE ASSOCIATION.

John Shinn, Topeka; Philip Bertrand, Wichita; James Foley, Leavenworth, and C. J. Prescott, Topeka.

Trade School of the North End Union, Boston.

The directors of the North End Union, a beneficent institution established in the city of Boston for the benefit of the less favored classes of the community, recognizing the value and importance of a definite trade training for American mechanics, determined last year to add a trade school to their work. With this object in view they issued in November a pamphlet appealing for aid in establishing such a school. Through the generosity of friends of the movement in Boston sufficient funds were provided to erect the necessary building and to equip an initial class, the plumbing trade being chosen as the first to be taught. On January 24 of this year the plumbing school was opened under the instruction of William L. Pierce, foreman for one of the leading plumbing firms of Boston, and it has so far proved remarkably successful.

Samuel F. Hubbard, superintendent of the union, writing to us recently, says in reference to the class: "Our little school has been started as an object lesson to encourage, as far as an example can do, the growth of the trade school idea. We have accommodation for only 29 pupils, and every place was filled within a week after the announcement was made. We have numbers on the list for the fall term. We are having the hearty co-operation of the master plumbers. Wm. H. Mitchell, president of the State Master Plumbers' Association, has given it much attention, and T. J. Tute has given most of the lectures."

The general plan of instruction closely follows that in operation in the New York Trade School, known as the Auchmuty system. The course consists of 50 lessons on two or three evenings of each week, ending in May. Examinations are then held by a committee of master and journeymen plumbers, when certificates are given to those pupils who are successful in passing the tests.

The general regulations are as follows: Seventeen years is the minimum limit of age at which scholars are admitted, and a reference as to character is required from each candidate. A fee of $10, payable in advance, is charged. All the required tools are provided for each pupil and materials are supplied free of cost. No one is admitted for less than the entire course.

The course of instruction is made progressive and is designed to cover the whole theory and practice of sanitary plumbing as thoroughly as possible. Each pupil is required to do the following work in the order in which it is given:

1. Seams.
2. Overcast joints.
3. Cup joints.
4. Calking.
5. Wiping horizontal round joints.
6. Wiping horizontal branch joints.
7. Wiping upright round joints.
8. One-fourth bends.
9. Wiping upright branch joints.
10. Wiping on a stop cock.
11. Wiping a flange on a 2-inch pipe.
12. Wiping a 2-inch ferrule.
13. Wiping a bath plug.
14. Wiping a vertical branch.
15. Wiping an upright flange.
16. Traps.

On completion of this course miscellaneous work is done, such as wiping 4-inch ferrules, making tank seams, wiping 2 and 3-inch joints, making service boxes, bottle traps, sand bends and fancy work. Lectures are also given at stated intervals explaining the principles which underlie the craft of plumbing, and every effort is made to impart to the learners as complete a knowledge as possible, within trade school limits, of the practical and scientific sides of the trade, leaving facility and speed of execution to be acquired subsequently by practice in the trade itself.

The first commencement exercises of the plumbing school of the North End Union were held in the Union hall on the evening of May 23, when the students were addressed by several prominent plumbers and others interested in trade school work. Samuel F. Hubbard, superintendent of the Union, presided, and was supported by Daniel G. Finnerty, president of the National Association of Master Plumbers; Wm. G. Mitchell, president of the State Association; William H. Sayward, secretary of the National Association of Master Builders; Samuel B. Capen, Rev. Charles J. Ames and others, who all indorsed the work of the school and expressed the hope that there would be a far larger number of trade schools in existence in this country. Specimens of the work of the pupils were on exhibition, and elicited the unqualified approbation of the visiting expert plumbers.

Superintendent Hubbard announced that the class would be resumed early in the fall. The plumbing class has been limited in number, owing to lack of room, but this drawback will, it is hoped, be overcome in time, as the school enlarges its borders. Other trades will also be taught. All communications in reference to the school should be addressed to Samuel F. Hubbard, superintendent, 20 Parmenter street, Boston, Mass.

The Consolidated Lehigh Slate Company, 154-156 South Fifth avenue, New York, make a specialty of plumbers' slate goods. At their showrooms samples can be seen of slate slabs for pantry sinks with splash and drain boards. They also show slabs for water closet bottoms and both round and square slabs for corner lavatories. A slate tank such as is used for chemicals is shown, and also slate urinal stalls. Register borders for both round and square registers in all standard sizes are carried in stock, and special sizes can be furnished at short notice. A specialty is making slate work to specification, and they are in possession of facil-

ities by which orders can be promptly filled. They also do a large business in roofing slate.

The Illinois Master Plumbers.

The Executive Committee of the Illinois Master Plumbers' Association held a meeting in the rooms of the Chicago Master Plumbers' Association, 173 Madison street, Chicago, on Monday, May 21. The committee is composed of the following members: President, Robert Loudon, Bloomington; vice-president, W. T. Geary, Chicago; treasurer, J. R. Scanlan, Elgin; Wm. H. Durham, Rockford, and T. P. Culloton, P. Sanders, David Whiteford and A. W. Murray, Chicago. The meeting was called to advance the interests of the State association, and judging from the reports read from nearly all parts of the State the various local associations are in a flourishing condition. It was moved by Mr. Murray that the place of meeting of the State convention be selected by the president and vice-president. On motion by Mr. Wade, it was decided that the convention be held Thursday, June 7. As Secretary W. E. Goodman had retired from business, J. B. Breen of Chicago was appointed to take his place.

National Service Box.

Ette & Henger Mfg. Company, St. Louis, Mo., are offering service boxes as shown herewith. The special feature

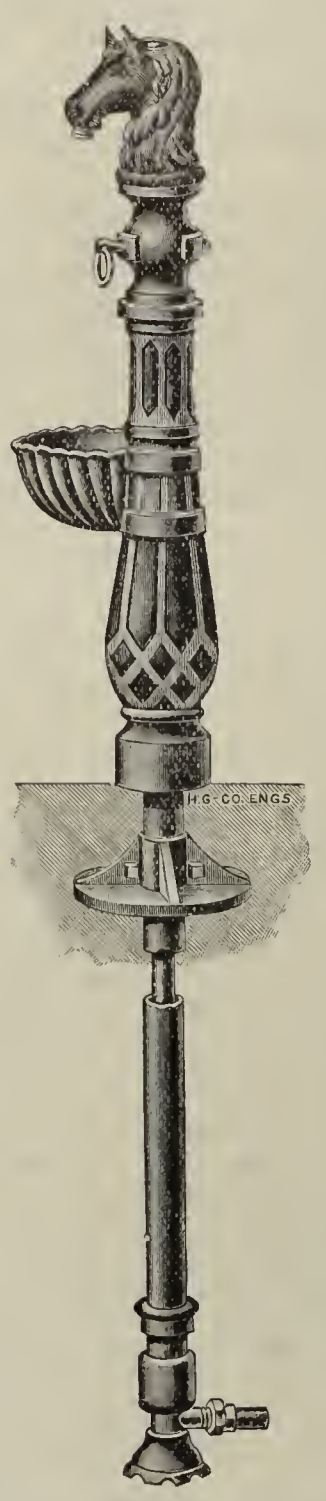


National Service Box.

is a stationary rod inside the box, attached to the service cock, and extending to within 12 or 18 inches of the surface. The combination key shown at the left of the box is adapted to opening the cover and also to fit on the end of the stationary rod, the same key serving both purposes. The manufacturers refer to the greater convenience of the short key as compared with the old style of long key for turning off or on, and state this device for stationary rod can be used in connection with all lengths and sizes of service boxes made by them.

Compression Stable Hydrant with Drinking Fountain.

Ette & Henger Mfg. Company, St. Louis, Mo., are offering the stable hydrant and fountain shown herewith.



Compression Stable Hydrant with Drinking Fountain.

The hitching post is ornamental and extra heavy with a stock 4 feet high, cast in one piece, the water passing through the inner pipe. A wheel handle is furnished instead of a key for turning the water on or off when so desired. A heavy flange is placed on the pipe to prevent the post being moved out of the ground by either horse or frost and to relieve the valve from strain. The manufacturers claim the device is anti-freezing, that there is no packing in the top parts and that it can be repaired without digging up. The posts are made to set in the ground from 1½ to 10 feet.

TRAPS AND VENTS.

AN INTERESTING CASE was recently decided in the New York courts which determines the standing of plumbers who have not complied with the law requiring registration with the Board of Health. An unregistered plumber sued for payment of work in the District Civil Court and won his case. On appeal to the General Term of Common Pleas, it was brought out that the plaintiff had not passed his examination, and the judgment in his favor was therefore set aside. If it becomes generally understood that work done by unlicensed plumbers is illegal and payment cannot be collected in the courts, it will have great effect in making all legitimate members of the trade comply with the strict letter of the law. It is said that there are over 500 plumbers at present in New York who are carrying on their business contrary to law, and it is extremely probable that a great many out of this number are not true plumbers at all, and if they can be compelled to stop work it will be much to the benefit of the regular plumbers in the business.

THE STATE ASSOCIATION OF MASTER PLUMBERS of Kansas met in their fourth annual session as Kansas City last week. There was a large attendance, nearly every firm doing business in the larger cities being represented. The convention was presided over by William Rowan of Arkansas City. The next meeting will be held in Topeka. Officers were elected for the ensuing year as follows: James Foley, Leavenworth, president; John Beasley, Pittsburgh, vice president; F. W. Doane, Lawrence, secretary; G. W. Searles, Atchison, treasurer.

WRIGHT BROTHERS have opened their plumbing store and shop in Jones' Block, Ipswich, Mass. They have stoves, tinware and plumbing stock.

CLARENCE HALL has purchased the plumbing and piping business of R. W. Whelden & Co., Oldtown, Maine.

P. J. CASEY of Claremont has opened the plumbing business in Lewis' Block, on Sunapee street, Newport, N. H.

THE NEXT CONVENTION of the State Association of Master Plumbers of Texas will be held at Austin some time in May, 1895.

THE COYNE & DELANEY MFG. COMPANY were recently incorporated under the laws of the State of New York to manufacture plumbers' supplies and metal ware in Brooklyn. Their capital is placed at $50,000. The directors named are Thomas F. Coyne, John J. Delaney and Hartman Hebeler of Brooklyn; Fred. A. Meyer of Rockaway Beach and Thos. D. Riley of New York City.

THE CLEVELAND RULE & HANDLE COMPANY, Cleveland, Ohio, send out card circulars directing attention to the Donohue soldering copper handle which they manufacture.

THE ARMSTRONG MFG. COMPANY, Bridgeport, Conn., say that the recent improvements made in the Armstrong pipe threading and cutting off machines have decidedly increased the demand for them. The same firm also report a brisk trade in their stock of dies and other tools for water, gas and steam fitters' use.

THE CHARTER OF INCORPORATION for the Association of Master Plumbers of the City of Memphis, Tenn., was filed for registration last week. J. A. Bailey,

John J. Bailey, C. E. Shinnick, A. Lagomarsino, Joe Massa, F. W. Reinhardt, C. J. Schultz, George T. Tweedy, Louis Tisdale, Frederick Fisher, John Hopkins, W. B. Lockey, Thomas McGrath. Edward McGowan, P. Callahan, R. H. Woods and Martin Woods are the incorporators.

FIRE completely gutted the plumbing shop owned by A. Levy, at 4009 State street, Chicago. It was partially insured.

THE MASTER PLUMBERS' ASSOCIATION of Salem and Vicinity has affiliated with the National Association. The association has 23 members, as follows: Salem—J. H. Trow, secretary; Jos. A. Andrews, John F. Cabeen, Frank Dearborn, H. M. Cawley, Frank Wendall, P. H. Sweeney, Geo. Norton, Chas. H. Phippen, Wm. H. Hart, C. J. Driscoll. Beverly—R. Robertson, president; J. Robertson, D S. Ingersoll, C. G. Pickett, A. M. Stevens, Wm. A. Weber. Peabody—Daniel B. Lord, E. G. Kelly, Geo. H. Norton & Co. Danvers—C. P. Perkins & Co., J. E. Ropes & Co., Caskin & O'Connell.

A MEETING was recently held by the master plumbers of Lynn, Mass., for the purpose of organizing an association. National President Daniel G. Finnerty, P. H. Winn of Nahant and several members of the Salem Association were present. The organization was started with 15 charter members and elected J. F. Morgan president, E. D. Russell secretary and J. C. Donnelly treasurer.

AT A RECENT MEETING of the Master Plumbers' Association of Cambridge, Mass., all the master plumbers of the city were invited. National President Daniel G. Finnerty and J. Warren French, president of the Boston Association, were present. A. Baumeister presided and addresses were made by the guests and the Inspector of Plumbing of Cambridge. After the meeting a banquet was served.

THE ATTENTION of the passer by is attracted to the establishment of the Colwell Lead Company, 63–65 Centre street, New York, by new plate glass windows in the front and a fresh coat of light colored paint and the regilding of the faucet which has hung in front of the establishment for years. Inside a greater display is made of plumbing goods than heretofore. The Scioto siphon closet is set up in working operation and a fine display of lavatory bowls is hung around the showroom. The office department is on the upper floor. Back of this building is the works and warehouse, which extends through to 524 Pearl street. Here are arranged their hydraullc pipe presses for making lead, tin and tin lined lead pipe; also their tower for making shot in all sizes from duck shot to buck shot. Their sheet lead mill, capable of turning out lead in sheets 8 feet in width and of various lengths and thicknesses, occupies a portion of this building. In the warehouse is a stock of all kinds of pipe and sheet lead, so that no order is long unfilled. They also make a specialty of cames for glaziers' use, both milled and unmilled. On the other side of Centre street a large building, at 66–68, is used by them as a storehouse for a general line of plumbers' supply goods.

ANTHONY F. BIEHL, a well-known plumber of Lancaster, Pa., died quite suddenly last week of pneumonia, after a brief illness. He was 44 years of age and is survived by a wife. He was a member of the St. Michael's and St. Anthony's societies and the New Knights of St. John's.

A. J. HUSTON, representing the Hart Mfg. Company of Cleveland, Ohio, is visiting the pipe and fitting trade of New York City in the interests of their Duplex stocks and dies to use for threading pipe and bolts. One of the features of the tool is that after the thread is cut it can be removed from the pipe or bolt without the slow process of unscrewing.

GEORGE BROWN of the plumbing firm of Brown & Byrne of New York City has entered into partnership with Amsbury & Son in the plumbing business at Penn Yan, N. Y.

LATTA AND FRANK LEIBOLD are placing goods in the Benham store room on Lincoln avenue, Goshen, Ind., for a plumbing establishment.

DU BOIS & DARRAGH, 61–63 Gold street, New York, have the New York agency for the Eureka smoke testing machine manufactured by the Bailey-Farrell Mfg. Company of Pittsburgh, Pa. They are meeting with considerable demand for this character of apparatus, and the smoke test is growing in popularity with plumbers owing to the fact that leaks can be detected by seeing the smoke escape as well as by the sense of smell.

GUIMARIN & BIXBY are a new plumbing firm at 9 South Broad street, Atlanta, Ga.

THE MOSELY FOLDING BATH TUB COMPANY, 161 South Canal street, Chicago, have issued an exceedingly artistic catalogue of their specialties. It comprises 32 pages of illustrations and descriptive matter. An introductory article sets forth the special features of the Mosely folding bathtub and gives details of the character of the materials entering into its construction. The styles shown are the Atlantic, Pacific, Northern, Southern, Wagner, Hub, Columbia, Armour, Exposition, Chicago and Pullman. These differ in details of style and finish as well as in methods of operation. All are folding tubs, but some are made to be heated with gas, others with gasoline and others to be attached to regular water service. Those with tanks and heaters attached are portable and can be placed in any room, thus making it unnecessary to have a special bathroom in a house. The catalogue also shows the Petite, a combined bidette, chiffonier and wardrobe. All their goods are very handsomely finished and some are richly decorated. Separate illustrations are given of the Mosely improved water heater, the Security waste and overflow combination faucet and a special supply faucet for supplying water by pressure to both tank and tub.

G. A. STANFIELD, who for the past two and one-half years has been in the employ of the Marietta Plumbing Company, has established himself in the plumbing and gas fitting business at 411 Second street, Marietta, Ohio.

JOHN HILDEBRANDT is fitting up a room on Fourth street, Logansport, Ind., where he will establish himself in the plumbing and gas fitting business.

PORTSMOUTH MACHINE COMPANY, Portsmouth, N. H., who are sole proprietors and manufacturers of Critchley's patent expanding reamer, advise us that the demand for this specialty still continues active. This concern also make an extensive line of plumbers' brass goods.

Alfred Hopkins.

At a special meeting of the Bridgeport, Conn., Master Plumbers' Association, last week, the following resolutions were offered and adopted in remembrance of the death of Alfred Hopkins :

Whereas, The untimely death of our dear friend, Alfred Hopkins, has removed from our midst one of the most popular members of our Bridgeport Master Plumbers' Association ;

Whereas, The good Lord has seen fit in His wisdom to call him to a happier resting place above ;

Whereas, The members of our association will miss him at their regular meetings and on their pilgrimages each year to State and national association gatherings, held for the elevating of our craft in knowledge and skill in their profession, for the benefit of the health and convenience of mankind in general ;

Whereas, Without his good fellowship and practical experience our meetings will never seem the same again, with him absent from our side ;

Whereas, His friends always felt renovated in mind after meeting him, he was so genial in his greeting, so generous to his friends and the deserving poor ;

Whereas, He was sought after by hosts of friends, by his employees and others that needed a kind and sympathetic shake of his hand, with a cheering word in their hour of trouble. His consideration and good advice often lifted the load from their minds and they departed from his presence with new courage;

Whereas, The lesson taught to the members of our fraternity in losing our companion should be kept continually in our remembrance, as the same summons might overtake one of us. We then should be prepared to meet that unseen and unknown country, leaving this mortality for that immortality beyond this vale of life's struggles;

Resolved, That by his death we have lost a valuable member and the city of Bridgeport a good citizen. To his family in this their hour of bereavement the members of our association extend their heartfelt sympathy;

Resolved, That these resolutions be placed upon the records of the association, and that an engrossed copy of them be sent to the family of the deceased.

The closing of all the workshops of the Grand Trunk Railroad is being seriously felt in Canada. In Montreal alone some 2500 men have been thrown out of employment.

The *Iron and Steel Trades Journal* of London reports that the demand for galvanized iron for shipment abroad was never so heavy as at present, notwithstanding the fact that owing to the depression in Australia, those colonies —usually the largest customers—are taking only about one-half of their usual supply. The use of galvanized iron throughout the world is growing rapidly, and new markets for this material are opening up annually.

The new $3,000,000 tunnel built through the Palisades by the Susquehanna & Western Railroad was formally opened for coal traffic on May 15. The tunnel is nearly 2 miles long.

The successful completion of the Manchester Ship Canal on the west coast of England has induced the trading community of Sheffield to take steps for carrying out the long contemplated plans for a ship canal from their city to the eastern coast. A company has been formed for the purpose, and a bill is now before Parliament authorizing the work of construction.

STEAM AND HOT WATER.

Cost of Heating Plants.

The question of ventilation in the public schools is just now engrossing a good deal of attention, says a writer in a Worcester, Mass., paper, and how to have the rooms heated and the air pure is the problem. Bids have been asked by the city for the heating and ventilation of Thomas and Winslow street school houses. Changes have been ordered in these buildings by the State officers.

There are various systems in use in the schools, and the cost for each room varies from $40 to $108, as shown by the report of the Superintendent of Public Buildings. It has always been a question why there should be such a difference, and people have wondered why one room could not be heated just as cheaply as another under the same conditions.

The Canterbury, Belmont and Salisbury street houses and the English High School are all provided with a mechanical system of ventilation, that is, a system where steam engines are used to run a fan. These buildings are also heated by steam.

In the Winslow and Thomas street schools there is no system, and these two buildings will have to be ventilated this seaeon.

Lamartine and Downing street schools are provided with the furnace system of ventilation. In Ash street is the Sturtevant system. The following figures from the report of the Superintendent of Public Buildings show the cost of heating and ventilating each of the buildings mentioned, and also each room:

	Rooms.	Total.	Per room
Canterbury street.. ...	12	$1,293.70	$108.22
Belmont street...	16	854.65	53.42
Winslow street.....	13	828.81	63.76
Salisbury street.....	10	50 .76	50.57
Lamartine street.	12	836.58	69 71
Downing street.....	12	729.77	60.81
English High.....	22	2,334.41	105 97
Classical High...	16	1,450.89	90 67
Ash street...	6	408.00	68 00
Thomas street.....	12	484.73	40.00

HEATING NOTES.

We have received from the Magee Furnace Company of Boston, Mass., a very neatly printed catalogue of 40 pages, printed in colored ink and bound in paper covers of attractive design. Its pages are devoted to the Magee warm air and hot water combination heater, made in six sizes and having a hot water capacity ranging from 75 to 700 square feet of radiating surface. The opening pages are given up to the subjects of heating and ventilation, followed by an illustrated description of the construction named. One page shows Magee's Boston heater as it appears in the basement of a dwelling, indicating in a general way the arrangement of pipes and fittings. Another page shows the relative position, as they appear in the heater, of the hot water sections and disk, while a third illustration shows the various sizes of hot water sections and disks used in the Magee combination system. The water sections are placed in the fire pot 4 inches from the bottom, and each one takes the place of 2½ bricks. Each section is tapped for 1½-inch, flow and return, although the double sections can be tapped for 2-inch if necessary. An interesting feature of this neatly arranged publication is found in the floor plans of a residence in Malden, showing the location of the heater, size of pipes and position of registers and radiators. The residence is heated with a No. 5½ warm air and hot water combination heater, four long water sections being used, attached to 425 square feet of radiating surface. The second half of the pamphlet is devoted to hot water radiators, tables giving list of sizes of Standard and National radiators, ratio of radiating surface to space heated, directions for using the Magee warm air and combination heater, tables showing sizes and prices of registers, capacity of pipes, together with a partial list of persons in various sections of the country to whom the manufacturers refer for information as to the merits of their heater. Numerous views are also given of buildings in which the company's heater is used.

The Baltimore Heating Company were incorporated recently at Baltimore, Md., with a capital stock of $5000, by John Trainor, John J. Kelly, Patrick Flannigan, Louis Becker and Duane B. Van Buren. The company will deal in stoves and other heating apparatus.

The J. H. McLain Company, Canton, Ohio, send out circulars illustrating the Canton heaters of their manufacture. This firm make an extensive line of steam and hot water heaters, the illustrations showing the Humber water heater, the Harvard water heater, Cambridge steam heater and the Yale and Sandow water heaters, all of which are illustrated in general and sectional views.

The New York Central Iron Works, Geneva, N. Y., are in receipt of a letter from the Assistant Quartermaster U. S. Army, Plattsburgh, N. Y., in which he says that he has set up under contract 29 Dunning boilers for heating officers' quarters, barracks and other public buildings at that post, and has been very much pleased with their performance.

The Gorton & Lidgerwood Company, 96 Liberty street, New York, have installed Gorton boilers in many prominent educational institutions during the past winter, and in all cases, we understand, the heaters have given excellent results. The firm report a good spring business and a favorable outlook for the future.

George W. Plastow, heating and ventilating engineer, representing Johnson & Morris, steam and hot water contractors, 239–241 South Fifth avenue, New York, is on the card presented to those who are interested in the question of heating and ventilation. Mr. Plastow recently visited a customer who gave an order for a considerable heating plant, saying: "More than 20 years ago your house heated a building for me, and the plant has been so free from annoyance and excellent in service that I remembered your house when I wanted this building heated."

A new attraction has lately been put in front of the establishment of the Crane Company, 122–130 Centre street, New York, dealers in pipe and pipe fittings. A length of 12-inch wrought iron pipe is supported by a stand made of flanges, nipples, reducers, ells and water ells, surmounted with a tee at the top of which is used an acorn for a finish. The pipe is protected by a coating of transparent varnish and the name of the concern, "Crane Company," occupies the center, while at one end is, "Pipe ⅛ to 24 inches in diameter" and at the other end are the words, "All sizes cut to sketch." At the corner of their building they have a 24-inch flanged tee.

The American Boiler Company, 94 Centre street, New York, have secured Parlor 217 at the Broadway Central Hotel, at 667 Broadway, where they will receive and entertain their guests at the convention of the National Association of Master Steam and Hot Water Fitters on June 19.

"Standing on the corner of Broadway and Duane street, New York, the following large buildings in which our radiators have been used can be seen: The Scott & Bowne Building, Produce Exchange Building, Mutual Reserve Life Building, Home Life Building and the Manhattan Building, with the Sheldon Building on Nassau street just off of Broadway," was the remark of a representative of T. C. Joy & Co., manufacturers of radiators at Titusville, Pa., with an office at 48 Centre street, New York.

On Wednesday and Thursday of last week the New England trade were very pleasantly entertained at the opening of the new showrooms of the A. A. Griffing Iron Company, at 177–179 Fort Hill Square, Boston, Mass. Chas. A. Lathrop, the New England manager of the concern, discharged his duties as host in a most happy manner, and the many members of the trade present were unanimous in their verdict of "a very enjoyable time." The new showrooms occupy the entire first floor, 35 x 80 feet, are well lighted and particularly adapted for showing the extensive line of Bundy radiators made by this concern. The numerous styles and sizes were artistically arranged, with a background of palms and other potted plants, which, with the bright colors of the radiators, made a very handsome picture. The radiator decorations, which were done by James Croke of Boston, are particularly worthy of note, several new effects in amaranth, lilac, emerald green and aluminum bronze being shown together with all the standard bronzes and enamels. On Thursday evening a collation was served, at which there was an abundance of both eatables and drinkables. A quartet and an orchestra furnished music for the occasion.

W. H. Page of the W. H. Page Boiler Company, Norwich, Conn., was the guest of Du Bois & Darragh, 61–63 Gold street, New York City, where an agency for New York and vicinity has been established for the All Right and Volunteer steam and hot water boilers. G. H. Weymouth will represent the house in this branch of the business.

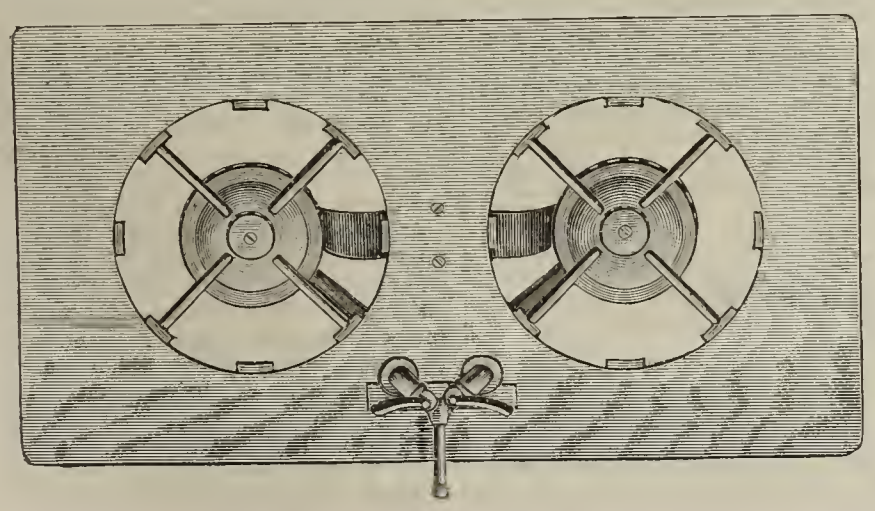
The Ferris Wheel in Tin.

We show in the accompanying engraving an unusually interesting example of the tinsmith's art. The picture, it is needless to explain, is a representation of the Ferris wheel in miniature, and we have received it, together with the following letter, from E. A. Armbruster of the Minnesota Hardware Company, St. Paul, Minn.:

I find great pleasure in reading *The Metal Worker*, which I have taken for many years. I am particularly interested in looking over the tin shop pages, in which are patterns and diagrams of various kinds of tin work. I send you herewith a photograph of an exact model of the original Ferris wheel which I have made of such scrap tin as goes to waste in the shop. The model is scaled ½ inch to the foot of the original wheel, and is composed of 10,989 pieces of tin and wire. It is lighted up and run by electricity, there being a two-candle power incandescent lamp in each car and one on each corner as a lamp post. Each of the 36 cars is loaded with from 18 to 20 passengers. The guards and various other people, ticket offices, sheds, elevated platforms and push chairs are all cut out of tin and painted. It took about four months of my spare time, such as noons and evenings, to make it. We have rented the wheel out to various parties for exhibiting in their show windows, and at present have it in our own window.



The Ferris Wheel in Tin.



Portable Gas Appliances.—Fig. 1.—Gas Cooker.

Portable Gas Appliances.

The illustrations presented herewith show some patent portable gas appliances that are being manufactured by the New York Stove Works, Peekskill, N. Y. These appliances are specially designed for use in connection with coal stoves. Fig. 1 is a plan view of a gas cooker. It consists of a cast iron plate, to which are attached two gas burners, which are provided with separate gas cocks, one controlling each burner, and an extension nozzle, to which a hose can be attached. By simply lifting off the covers and cross piece over the fire chamber of any cooking range, the gas cooker can be set in place, the square plate enabling it to fit any stove regardless of the difference in size of the covers ordinarily found. Then a hose may be run to some convenient gas fixture and connected with the nozzle of the apparatus. This will be found specially convenient in cases where a coal fire has been used but has died out from inattention, as the gas cooker can be put in operation in a few minutes, furnishing a good hot flame for cooking, under one or two holes, as may be required. Fig. 2 shows a gas baker burner which is designed to be set in the oven and connected to some of the gas fixtures with a hose. To secure a more equal distribution of the heat a burner is placed under each end of the plate and connected to it. The food to be baked is then set on the plate the same as in an ordinary oven. In using the gas baker it is best to lift off the oven door of the stove, or if it cannot be lifted off, it should stand open. Fig. 3 shows the gas baker front, which is designed to fit on the baker and close the front of the range instead of the oven door, and is arranged with perforations, by which the oven is ventilated. The baker and front are made in three sizes, to suit different sized ovens, and the baker front is partially made of sheet iron, which allows it to be cut to fit the particular oven in which it is used. With these appliances any coal cook stove can be turned into a gas cooking apparatus in a few minutes, and all the benefits of a gas cooking apparatus derived. In addition to these appliances the company make a large variety of gas hot plates, sad iron heaters and gas cooking furniture. The management of this department of their business is in the hands of an expert, and they claim that their goods have proved highly satisfactory wherever introduced.

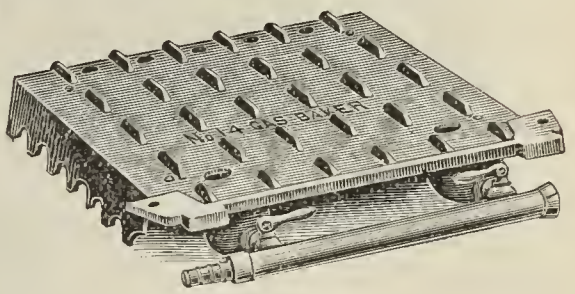


Fig. 2.—Gas Baker Burner.

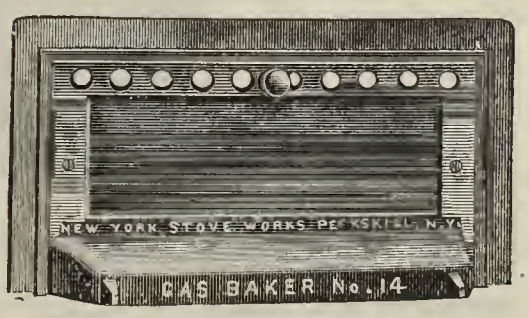


Fig. 3.—Gas Baker Front.

THE RETAIL STORE.

No. 16 Novelty Spray Pump.

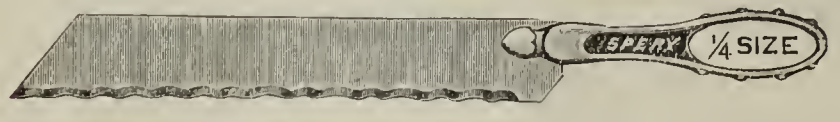
Hess, Snyder & Co., Massillon, Ohio, are offering a spray pump as shown in the accompanying cut. In construction, a heavy brass cylinder is screwed into the plunger or bottom of the pump, to make the pump short and strong. The handle can be placed in any position around the pump, which feature is referred to as an advantage. It is stated that the handle attachment which connects the handle with the plunger rod allows water to be pumped in large quantities with ease, and that the pump has a 6½-inch stroke. The agitator consists of a ¼-inch pipe which screws into the base of the pump and extends to the bottom of the barrel to keep the solution thoroughly mixed at all times. The pump is fitted with an attachment for either single or double line of hose, to which spray or solid stream tips can be connected. The pump is designed to attach on a tank or barrel, as shown in the cut. The manufacturers claim that the pump can be taken apart in five minutes, and that nothing but the best material enters into its construction.



No. 16 Novelty Spray Pump.

Spery Serrated Edged Knives.

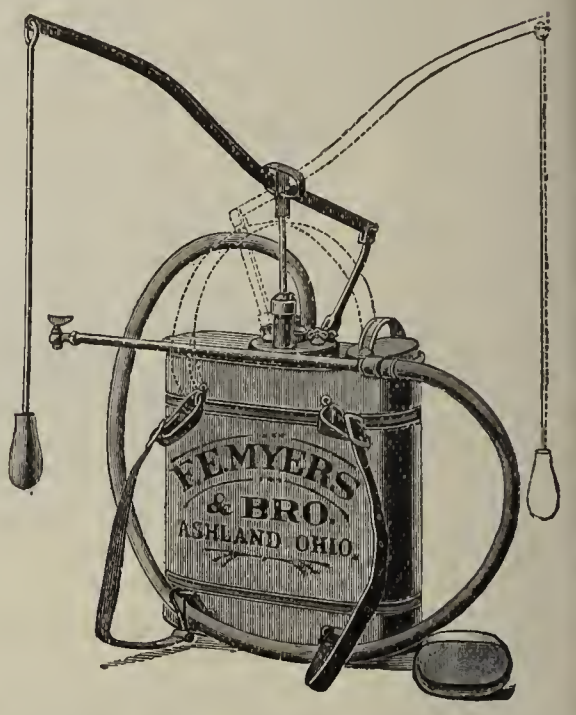
Charles F. Spery & Co., St. Louis, Mo., for whom Bronson & Near, Cleveland and New York, are sole agents, are introducing serrated edged bread, cake, paring and coring knives, as herewith shown. It is explained that the serrations in these knives are deep and shallow, short and long; the short, shallow teeth doing the principal cutting, the long, deep serrations preventing any possible clogging and tearing. In other words, it is remarked, uneven serrations do the work more easily and much smoother, upon the same principle that a serrated or saw edge knife will cut hot bread or cake better than a common knife. The knives are made with straight and curved blades, the curved blade being recommended by the makers as superior for cutting bread or cake, as the center of the blade strikes the bottom of the loaf or the top of the bread board first, making as clean and perfect a cut at the bottom of the loaf, without tearing, as at the top. The manufacturers state that the knives are made from crucible steel, finely tempered, and that they will not only retain their shape but will hold a perfect cutting edge. The knives are sold in sets, set No. 1 containing 1 each bread, cake and paring knife, straight blade; set No. 2 containing the same assortment with curved blades.



Spery Serrated Edged Knife.

The Myers Knapsack Spray Pump.

F. E. Myers & Brother, Ashland, Ohio, are introducing a knapsack sprayer, as herewith illustrated. The tank is made to hold five gallons and is fitted with removable lid and strainer. The pump is constructed of brass, so as not to be affected by the poisonous arsenites used in the various formulas for spraying. The pump has a large air chamber, ball valves, solid plunger and agitator. The point is made that the pump is so arranged that the hard work is done on the down stroke of the piston, and so that no water can drip on the operator. The pump can be removed from the can easily and is fitted with handles, so that the operator can use it with either the right or left hand, as the cut indicates. It is explained by the manufacturers that by removing the lever the sprayer can be used in the same manner as their tank spray outfit, by setting the knapsack on the ground and working the pump by hand hold. The dotted lines indicate the manner in which the strap can be snapped to the opposite side of the can in a loop, serving in this position as a bail to carry it by when using it as a tank sprayer. The sprayer is referred to as a common sense device, answering the purpose of a knapsack sprayer equipped so it can be operated with the right or left hand, and also so arranged that it may be used as a tank or can spray, thus making it competent for washing windows, buggies, and for other uses of this kind at times when it is not required as a knapsack sprayer.



The Myers Knapsack Spray Pump.

STOVE TRADE NOTES.

The Local Stove Trade.

The stovc trade in New York and vicinity, ss interpreted from the various terms used by the dealers to designate its condition, is between very bad and fair—the adjective "good" being seldom heard in this connection. It has been so since March, a month in which the trade in stoves reached proportions more nearly normal than for several months before. It was due, it might seem, to a renewal of manufacturing opcrations in many lines, based in some cases upon an assumption that the breaking up of winter would bring an end to suspended demand, and in others to the charitable disposition of the bosses. It continued for a few weeks only, until the hallucination was shattered on the one hand and bank balances on the other.

The demand which set in at the close of winter was short lived, and production necessarily so, proving that production must follow and not precede demand. The people's requirements must be greater than for years past, but their means are smaller and their confidence less.

When an epidemic of disease is on the wane there still remains some sickness and almost as much fear, the latter element continuing to disturb the equanimity of the public mind long after the danger is past. So with a commercial panic—the panicky feeling, the distrust and want of confidence remain after the cause has disappeared, and the fear created by a panic in business in 1893 is not one to be soon forgotten. The man who has been idle for months will not feel sure that his troubles are ended for good when reemployed, and will fortify himself against a similar experience all he can. The business man who managed through great efforts snd the strictest economy to tide over the crisis will not be apt to plunge into extravagance. The burnt child dreads the fire, and it would take an unexpected boom quite as astounding as the panic to draw men's minds entirely away from the morbid condition into which they have fallen, and which the slow growth of returning prosperity will take months to accomplish.

That thousands of men who have been idle for a long time have obtained employment this spring there is no doubt; that they have worked for less money and followed a strict rule of economy and paid back borrowed money there is no question; that they have bought but little is also a fact, for the sale of stoves still shows a lack of orders for such goods as the masses buy. The sale of oil and gas stoves has been a disappointment to dealers as well as coal constructions, though an impression prevailed with many that trade in them would be good, and many would buy such stoves who could not sfford the outlay for the high priced ranges. Collections with the wholesale stove houses have naturally been affected, as the scheme of finance followed with a large proportion of the smaller stove merchants resolves itself into paying for winter stoves out of the proceeds of spring sales of oil, gas and coal stoves, and for those from cash received for baby carriages and refrigerators, and for them from the sale of winter stoves again.

A strange freak of trade is its great unsteadiness. It is not evenly dull nor steadily fair. For one or two days it is good and everybody is busy, only to be followed by extreme dullness with nothing to do. However, business is certainly on the up grade, but the grade is steep and the going slow. The market is running low in some sizes of many articles manufactured of metal, an uneven depletion of stocks that leaves too much on hand in the aggregate to warrant a resumption of factory operations and so little of ready selling sizes that sacrifice in price is not necessary or wise.

SIFTER.

Estate Oak Air Tight Radiator.

F. & L. Kahn & Brothers of Hamilton, Ohio, have placed upon the market a handsomely decorated heater, which is known ss the Estate Oak air tight radiator. This consists essentially of an oak stove located within a perforated jacket. The base, instead of being composed of the usual three, four or five pieces, having numerous joints, is made in one piece with only 52 lineal inches of joint space, limited exclusively to the ash pit door and registers. The inner body is corrugated for the purpose of providing largely increased radiating surface and immunity from cracks and wear. The stove is mounted on legs in the usual way, but they are so arranged with respect to the extreme bottom that base strips are attached to cover all without the use of bolts. There are provided in a very clever manner circulating ducts for the passage of air between the inner body and the envelope or jacket from the extreme bottom to the top. The draft registers, instead of sliding, are made in the form of a screw with circulating cap and handle at one end, which offer opportunity for close grinding and adjustment. The stoves, although intended chiefly for use in soft coal regions, have been sdapted and are claimed to possess all the requirements of successful hard coal burners. The magazine is jointless and made in one piece to prevent leakage. The manufacturers state that fire can be kept continuously from one charge of fuel of any kind as long as 50 to 60 hours, depending upon the quality of the fucl and the character of thc chimney. The stoves are offered at a moderate price, on which account large sales are anticipated. We understand that the makers have already secured four patents covering the improvements and several more applications for patents are now pending.

William Resor & Co.

of Cincinnati, Ohio, favor us with a copy of an exceedingly neat and tastefully printed price-list and catalogue which they have issued relative to their leading specialties. Since the last edition was distributed to the trade the makers have added a number of new styles and sizes to their list, covering cook stoves, ranges and heaters. Among the latter may be mentioned the Royal Monitor six-hole cook stove, intended for burning wood as a fuel. Its constructive features include detachable end top shelf, ventilated oven, large smooth swing hearth plate, patent oven door opener, portable reservoir, which is placed over the two boiler holes in front of the smoke pipe, and an arrangement of the front swing fender by which the overdraft to the fire box when starting the fire is prevented. The Royal Monitor is made in two sizes and several varieties. Another novelty which the company have recently introduced to the trade is the Electric Monitor six-hole range for using coal. This stove has extra large water front, heavy fire box linings, cut top and bottom oven plates. patent oven door opener, large sheet flues, ventilated oven and shaking and dumping grate. It is made in two sizes and presents a substantial appearance. The ornamentation is effective, the treatment of the oven door being rather out of the ordinary. Another construction to which special attention is invited is the Monitor base burner for hard coal. This is made in three sizes, has large magazine, made in sections, heavy fire pot, duplex grate, capacious ash pan and tea kettle attachment. The nickel parts are so ventilated that they will not discolor, and the top ornament is a handsome combination of polished brass and nickel with enameled base.

The upper section of the stove is so constructed that there is formed between the nickel work and the main plates of the stove a largc hot air chamber, this being connected at the back with the circulating flues, which extend to the floor. The catalogue consists of nearly 150 pages of letterpress and presents illustrations of an extensive assortment of Monitor stoves, ranges and heaters.

THE BUSINESS recently owned by the Lake Shore Foundry Company of Chicago and operated under the name of Metzner & Co. has been sold to the Manufacturers' Stove Repair Company. The new company are enjoying a large

trade and are organized on a substantial financial basis. The Lake Shore Foundry Company guarantee all bills that may be contracted by them until further notice.

New Chicago Warehouse of Detroit Stove Works.

The Detroit Stove Works have just completed a fine warehouse in Chicago, located at Nos. 2921 to 2929 La Salle street, between Twenty-ninth and Thirtieth streets. The rear abuts on the Chicago, Rock Island & Pacific Railroad, from which the stove company have a private siding which runs in on their own ground immediately alongside their building. In acquiring this site the company purchased more ground than is covered by the warehouse, with a view to possible enlargements in the future. The size of the building is 100 x 105 feet, five stories high, not including the basement. Being built by the company for their own exclusive use, the warehouse was designed to meet the special requirements of the stove trade. The arrangements are, therefore, of a special character, and the details are peculiarly worthy of extended notice.

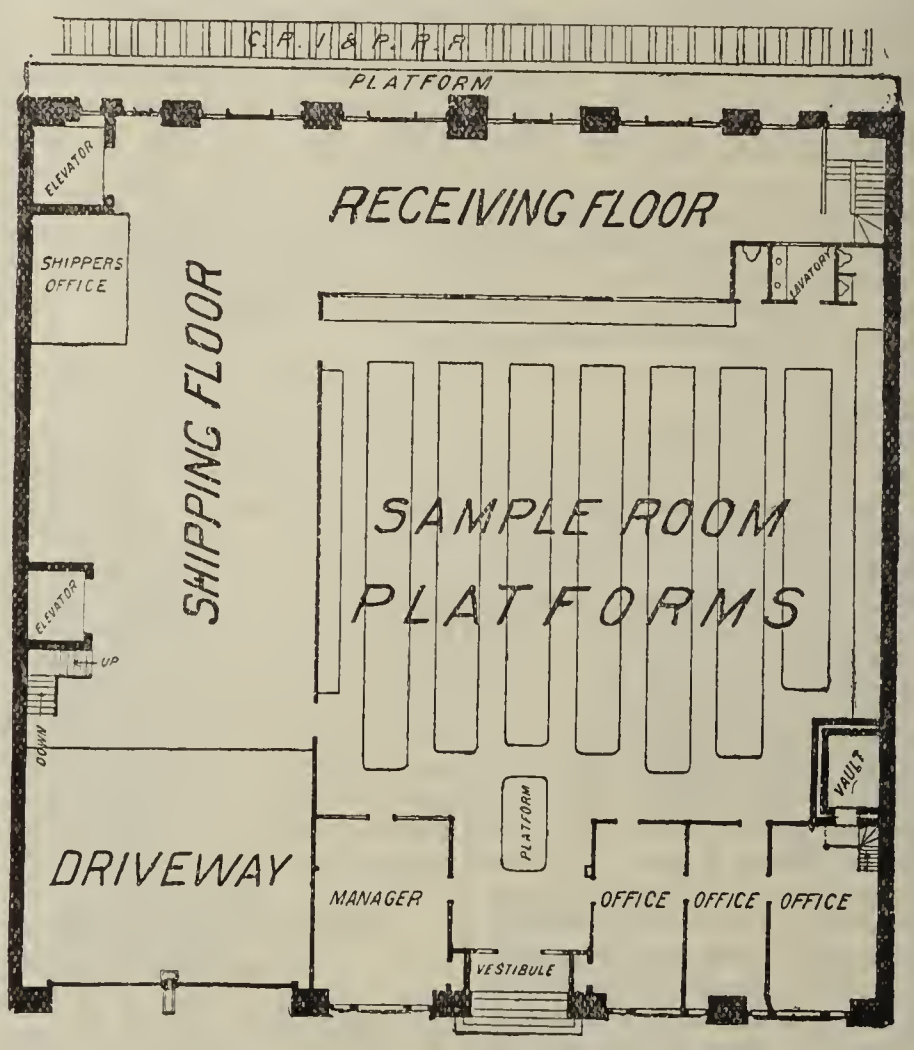
The first floor, a plan of which is shown in the accompanying illustration, is laid out for offices, sample room and shipping room. The shipping room has not been sacrificed for the benefit of the offices, but has received proper attention. It extends in the shape of an L from the La Salle street front around the whole rear of the building. In the rear it faces the company's railroad track, along which a platform extends on a level with the floor of a freight car. There are four doors opening on the platform, and four cars can be handled at one time. It has been shown by actual test that a car can be loaded or unloaded here in half an hour. The shipping floor is large enough to set out from seven to eight carloads of stoves with ease. At the La Salle street end of the shipping room is a team entrance for city business which is capable of accommodating three teams at one time. Stoves can be loaded and unloaded here under cover, without regard to the weather. Two elevators are in use. One is a power elevator of large size which will carry a full team load. The other is a hand elevator, particularly convenient for lowering stoves from the upper stories for small shipments.

The sample room, on the same floor, is very commodious, nicely arranged and well lighted, having windows on three sides. The platforms have a hardwood finish, are varnished and have round corners, adding much to the appearance of the room. The steel range samples are placed in a row across the back part of the room on a platform slightly higher than the others, making a very fine display. The offices are in front. The manager's office is on one side of the main entrance and the general offices are on the opposite side. These offices are handsomely appointed, the manager's room being wainscoted in panels and furnished with a carved mantel, while the general offices are divided into several apartments by oak and plate glass partitions. A feature of the general offices is a large two-story vault for storing valuable papers.

The basement has a high ceiling and is unusually light. In one corner is the engine room, containing a 20 horse-power Otto gas engine, which operates the power elevator. It is run with natural gas, but can be connected with the manufactured gas supply whenever necessary. A large part of the basement is occupied by the stove repair department, containing between 600 and 700 casting bins. Considerable room is left for the storage of stoves.

The upper floors are used wholly for storage purposes. On the second floor ranges and cook stoves are carried. The third floor is exclusively used for high grade heating stoves. All the space on the fourth floor is given up to Jewel oak stoves. The top floor is used for medium priced and lower grade heating stoves.

The building is pronounced by architects and builders as one of the very best warehouses so far erected in Chicago. It is a most substantial structure, having unusually heavy brick walls with steel girders, cast iron posts and 6 x 12 inch joists on every floor and



New Chicago Warehouse of Detroit Stove Works—Plan of First Floor.

even supporting the roof. All the floors are of hard wood. Every story is well lighted, so that stoves can be inspected in the middle of the building as easily as at the ends. The front is more ornamental than the regulation warehouse. It is faced with handsome dark colored pressed brick. The main entrance is recessed, with heavy iron gates guarding the approach. Taken throughout the building reflects great credit on owners and designers.

The Detroit Stove Works exhibit on their sample room floor at 2921 to 2929 La Salle street, Chicago, a superb line of steel ranges. These ranges are more profusely ornamented than has generally been the custom, as a demand has sprung up for variations from the rigidly straight lines of such goods. The fronts are made of cast iron, molded with relief work, with ornamental columns at the corners giving apparent support to the top. The high shelf is built with the sides running in graceful curves, with nickeled edges. The interior construction is in keeping with the imposing exterior. Oven doors are balanced. Oven bottoms are not made in one piece, but are sectional, consisting of four pieces of flanged sheet steel, to guard against buckling.

The Keeley Stove Company

of Columbia, Pa., have just issued a 148 page catalogue descriptive of their line of goods. A leading feature of the book is the variety of stoves appearing this season for the first time. The opening pages are devoted to a presentation announcement, information in regard to ordering stove repairs, with price-list of repairs and terms and special notices. The catalogue proper commences with illustrated descriptions of the Columbian Newport and Newport ranges which are followed by the Columbian Choice, a new six-hole range in six sizes, suitable for hard or soft coal, with side ash pit, bed plate in two parts, tea shelf, reservoir, cozy high closet and heating attachment. The new Cappello is described as a new sheet flue range, in six sizes, for hard or soft coal or wood. Then follow more ranges, including the Columbian Choice, 1893, in two styles, and the New Cappello, 1893, also in two styles; Columbian Plato, Columbian Star, Columbian Charm, Columbian Dandy and Daisy, Columbian Gem, Vim, Columbian Bessie and Pet. Next in order are cook stoves, the line covering the Regulator, Golden Grain, Columbian Dora, Columbian Alliance, Miner's Friend and Dolly. About 38 pages cover heating stoves, prominence being given to the Columbian Joy, 1894 pattern, a reversible flue base burning square parlor stove, in five sizes, embodying the ventiduct system of circulation and radiation; the magazine is fitted without

holes or screws, and the whole stove may be easily dressed by a dealer without screws. It has cold air caps to keep the nickeled under body from tarnishing, and is supplied with center draw or triplex grates which can be removed or placed in position through the ash door. The Columbian Aid, Columbian Cadet, and Alpine stoves are also presented, followed by the Columbian Sun, a new surface burner, made in five sizes, and the Columbian Queen, a new return flue sheet iron surface burner of medium price with nickeled skirt and foot rails. Other new stoves shown are the Morning Light, a direct draft sheet iron single heater, and the Morning Light, a double heater in five sizes. The remaining heating stoves shown comprise the Grip, New Morning Light, Nobby, Active and Columbian Ulster. In open heaters are noticed the Luxury, Columbian Chime, Columbian Prize and Pearl. The Columbian Ulster, a portable heater, is shown remodeled, and the Columbian Crown is described as a new departure in stove construction. It is made to operate upon the ventiduct system, thus heating by circulation and radiation. The usual line of cylinder, laundry and wood stoves occupies some half dozen pages, followed by Columbian Vulcan and Columbian Banner furnaces, which have been redressed for the coming season's trade. A full page engraving shows the interior of a house heated with a Columbian Vulcan, with its hot water combination heating an upper room. One, two and three burner gas cooking stoves, lately put on the market by the company, are also illustrated, as well as a new gas heater for small rooms. The remainder of the book is taken up with utensils, tools and supplies and descriptive lists of repairs.

The company have this season adopted for their ranges interchangeable covers and centers, so that one size will suit all ranges. The centers are in two pieces, to prevent warping or twisting. Another improvement is in the style of shakers used. One shaker now will fit all stoves and ranges having the triplex grate. The shaker is to be known as the Columbian Daisy, and has a stop on the socket which prevents withdrawal until the grate is in proper position.

"The Blue Book of the Stove Trade"

is the title of a substantially bound volume of over 450 pages which is published by the American Stove Association of New York and Chicago. As indicated by its title it is a "blue book," being bound in stiff board covers of a shade of deep blue. The paper is of good quality and the edges are finished in bright red, giving to the volume a very attractive appearance. The work, which has just been issued from the press, is "a book of special credit reference for the use of all who sell to the stove trade of the United States." Probably the most conspicuous feature is the system of three ratings indicating the business investment, the total responsibility and the paying habits of the concerns rated. The preface states that the volume contains the names and ratings of nearly 40,000 merchants who sell stoves. From the prospectus which accompanies the work we learn that the purposes of the American Stove Association are "to furnish more accurate, prompt and reliable credit information than is obtainable from present existing sources; to protect prompt paying and responsible stove dealers by restricting to proper limits the credit of their incompetent, dishonest or otherwise unworthy competitors; to provide a means for the prompt collection of past due notes and accounts by more rapid and satisfactory methods than at present prevail, and the correction of the many petty abuses to which stove manufacturers are subjected at the hands of unscrupulous stove buyers." The manager of the association is Charles E. Brackett, Manhattan Building, Chicago, Ill. The New York office of the association is at 150 Canal street.

ODD PLATES.

THE MICHIGAN STOVE COMPANY, Detroit, Mich., are constantly extending the territory in which their goods are sold, and now and then receive orders from parts of the world where Garland stoves have never before been placed. During the past week the company received an order for two Garland stoves for shipment to Calcutta, India, and accompanying the order was the following explanation: "This order is quite a novelty, all of the parts considered. The stoves are to go from Calcutta 1000 miles northeast to Nsga Hills, in Assam. For the last 500 miles of the journey they will have to be carried on the backs of natives. These stoves go 500 miles beyond where any stove has ever been sent, and it will take nearly a year for them to reach their destination."

The Metal Worker last week had the pleasure of a call from J. W. Lane, Newton, N. J., whose reminiscences about the early days of the stove and tin trade in New York City were exceedingly entertaining. Mr. Lane knew many of the old time Water and Beekman street merchants from whom he bought goods when he began business in Newton.

THE CANFIELD STOVE COMPANY, Rondout, N. Y., publish in connection with their advertisement in a recent issue of the Kingston *Daily Freeman* a series of verses entitled "A Grandmother's Surprise." The verses tell of the time when Kingston was a wilderness and of the old Dutch oven in which the grandmother baked her bread. They also tell of her first cook stove and in later years of her opinion of the first range she saw. Now, when she goes to visit her grandchild and watches the operation of a New Process vapor stove, her surprise is unbounded, and

> She hardly thinks it can be true
> Of all the work this stove can do.

THE STOVE PLANT of the Bussey & McLeod Company, at Troy, N. Y., will resume operations June 1, after a shutdown which has lasted a number of weeks. The works will probably start off by giving employment to 250 men.

ABOUT A YEAR SINCE Rathbone, Sard & Co. of Albany, N. Y., introduced the Acorn radiator for coal to the trade as a new departure. They believed that the vast number of people who use soft coal as a fuel were not satisfied to be confined to the ordinary oak stove as their only choice for heating purposes; also that a more attractive stove, having the advantagee of the best oak stoves in holding fire, would find a ready demand. Their anticipations were realized and many thousands were purchased. The Acorn radiator is practically an air tight oak stove surrounded by an ornamental cast jacket. It has the advantage of the intense radiation of heat from the sheet steel body, combined with the circulating power obtained through the double walls which are open from base to top, producing a strong current of heated air. The radiator can be mounted air tight, and we understand tests have proven its power to keep fire 48 hours with one hod of soft coal. A feature is that the outside jacket does not become discolored by heat. The manufacturers have issued a handsome circular illustrating the construction.

THE PHILLIPS GAS STOVE WORKS of 92 East Eighth street, Cincinnati, Ohio, are directing the attention of the trade to their line of gas ranges by means of a very neatly printed 24-page pamphlet, bound in colored paper covers. The goods are made under the name "Phillips," and are offered in a variety of sizes and styles. The top surface is provided with four boiling burners, one being double, the other single, while the oven is heated by means of two powerful burners with pilot light attachment. The baking oven is jacketed and has the company's combination asbestos and cast iron bottom. The oven is fitted with an automatic drop shelf operated by the opening and closing of the doors. The broiling and roasting oven is provided with a tin drip pan and pan grate. The burners used are operated by means of the manufacturers' improved cone seated valves. One form of the Phillips gas range is provided with water heating attachment, the heater being of brass and tested to 200 pounds pressure. It has two burners with separate valves and a pilot light attachment. The top plate of the heater has two griddle holes over which cooking can be done, while the water heater is in use. The manufacturers state that the heater can be attached to heaters Nos. 36 and 25. In addition to the line of gas ranges the pamphlet gives attention to the Gimper hot plate, the Phillips gas circulating water heater and the Phillips hot plates. Full directions are also presented for operating the Phillips gas range and reasons why these goods are the best.

"THE CHEERY WOOD FIRE" is the name of an attractive pamphlet of nearly 50 pages which reaches us from William Resor & Co. of Cincinnati, Ohio. The title indicates to some extent the contents of the pamphlet, although primarily the booklet is intended to introduce the company's new base heating hot air circulating wood parlor stove, to the planning and construction of which they have given a great deal of time and careful and extended study. The Monitor parlor base heater, for wood, is illustrated and described at considerable length, following which we find a large number of letters containing the opinions of some of those who have used or handled this stove.

GEORGE B. COBB & CO., 155 West 125th street, New York, are issuing a circular with the suggestion "Cook with gas." It shows how to save $4.57 per month according to their reckoning. One dollar is used for wood for kindling fires and $6 for a ton of coal a month, amounting to $7. By the use of a gas range the gas bill amounts to $2.43, leaving the above difference in favor of gas. This is a novel appeal in favor of the benefits of cooking with gas, and the balance of the circular is devoted to describing the comforts derived from the use of gas fuel and the different methods of cooking and performing kitchen service with it. A final sentence is, "We have on exhibition in our salesroom a large assortment of gas

stoves and ranges." They also make a specialty of the Welsbach light for reading, writing and sewing.

THE PLANT of the Coldwater Oil Stove Company, at Coldwater, Mich., is the subject of an interesting article which appears in a recent issue of one of the local papers. From it we learn that early in the winter the superintendent leased what is known as the Titus Foundry, in which to make the castings for the stoves, but finding the capacity inadequate for the purpose at once made improvements. A new cupola was put in, the old molding room torn down, and a new one 40 x 120 feet erected, in which 35 molders turn out daily the castings for 80 stoves. The nickel plating department is contained in a room 22 x 80 feet, giving employment to ten hands, under the management of William Mason. The mounting, packing and shipping are done in a three-story and basement building covering an area 40 x 100 feet. In the rear of the main building is another structure, 30 x 60 feet, where the oil tanks of the stoves are tested. The article states that thus far in the present year orders have been received for 6000 stoves from the Western trade alone, and it is expected before another winter the sales will aggregate 15,000 stoves.

CHARLES F. BARTLETT, Tenth and Filbert streets, Philadelphia, Pa., is sending out an eight-page circular of the London Café wrought steel gas range. The ranges are made with baking, broiling, roasting and warming ovens, and with burners for cooking on top of the range. One of the cuts shows the range with smoke canopy, hot water boiler and plumbing work as recently installed in a handsome residence in Philadelphia. The circular also shows Perfection gas grates and gas heaters.

S. T. PECKHAM, general sales manager of the Palermo Mica Company of 27 Peck Slip, New York, favors us with a sample of a unique business card which is employed by the concern that he represents. The card consists of a sheet of mica 2¾ x 6 inches in size, almost as clear as crystal, upon which in silver letters appears a request, addressed to stove manufacturers, not to forget the fact that by placing their orders for mica for the coming season with the Palermo Mica Company they are likely to save money for their customers.

THE CRAIG-REYNOLDS FOUNDRY COMPANY, Dayton, Ohio, are meeting with a very gratifying demand for their Triumph series of warm air furnaces. These goods embody a number of novel features and are proving so popular with the trade that the manufacturers are in daily receipt of flattering testimonials relative to the merits of the line.

THE LEXINGTON (KY.) STOVE COMPANY, it is reported, are building an extensive addition to their foundry.

ACCORDING to recent Western advices the works of the Thatcher Furnace Company at Argentine, Kan., were recently sold to Homer Smith of Topeka, and we understand it is the intention to incorporate a company with $100,000 capital for the purpose of pushing the business.

THE PORTSMOUTH STOVE & RANGE COMPANY, Portsmouth, Ohio, write us under recent date as follows: "So far this year we have run full every day, except Sunday, and have not taken a single holiday, and were even so wicked as to run the day John Robinson's circus was in town." The Model wrought steel range has had several new and important improvements added recently and the demand for it is such as to readily indicate the rapidly increasing popularity of this branch of their productions.

A PRESS DISPATCH from Fulton, Ill., published in a recent issue of the Chicago *Inter-Ocean*, states that the Mississippi Valley Stove Company have discovered a valuable bank of molding sand 15 miles east of Fulton. The bank is said to be worth thousands of dollars to the company, for the reason that they have hitherto been compelled to ship sand from the East at high freight rates. The sand is pronounced to be superior to any the company have ever used.

THE INDIANAPOLIS STOVE COMPANY of Indianapolis, Ind., have filed a notice of the reduction of their capital stock from $50,000 to $30,000.

THE PENINSULAR STOVE COMPANY, Detroit, send us a sample of their new trade-mark stickers, for which, we understand, there is a great demand among their customers. The stickers are in two sizes and of various colors. Dealers handling Peninsular goods consider the stickers excellent advertising matter, and agents are supplied with them in such quantities as may be required.

THE HOT AIR FURNACES made by the Kernan Furnace Company, Utica, N. Y., will be used in heating the new school building at West Winfield, N. Y.

PERRY STOVE COMPANY, 242 Water street, New York, are offering the trade a new double lamp stove which they call the Shoo Fly. It is furnished with either two or four hole extension top. They are also showing an extension top to be used in connection with their No. 2 Fire Fly gas hot plate, which practically gives another cooking hole.

THE FULLER-WARREN COMPANY are busy putting their new quarters in proper shape at 147 and 149 Lake street, Chicago. A great deal of remodeling was needed to adapt the building to the special requirements of the stove and furnace business. When everything is completed, however, they will be in very much better shape for handling their trade than at their former location. They now have three floors, each 40 x 165 feet, more than doubling their facilities. Their building being situated on the south side of the street, they have the advantage of north light in their offices and drafting room, which are in the front part of the sample floor. These are neatly fitted up with oak and plate glass half partitions. The sample room is well lighted by large windows in the rear as well as from the front. They have an independent elevator, instead of sharing in the use of one with other tenants. The floor above the sample room and offices is used for castings, and the top floor is fitted up as a furnace shop. Their facilities for the transaction of business are now of the best character, enabling them to meet all the requirements of their Chicago trade. They have a large alley in the rear for shipping, which is an important advantage over the cramped alley at their old place of business. The Fuller & Warren Warming & Ventilating Company have their offices here also.

THE DETROIT STOVE WORKS have issued a very tasteful illustrated circular announcing the removal of the Chicago branch to the new warehouse, 2921 to 2929 La Salle street, Chicago. An opening and reception took place on the 25th inst. from 9 a m. to 10 p.m.

The Kind Hearted Farmer.

The prevailing dullness in the stove trade is keenly felt by the average traveling salesmen, and we sometimes hear of them resorting to queer expedients to increase sales and keep down expenses. The boys on the New England circuit are telling a story which has for its hero S. H. Plumb, who represents the Stamford Foundry Company of Stamford, Conn. It appears that Mr. Plumb found himself one afternoon recently in New Hartford, Conn., and having finished his business desired to go to Winsted, which is distant some eight miles. The train he intended to take was found upon inquiry to have been discontinued, so there was the prospect of remaining in the town for five or six weary hours. This was too much for the energetic spirit of our friend Plumb and he started off on foot for Winsted, carrying without effort a nice little order for Stamford ranges. The day was warm and the road dusty, and our traveler, after having covered four or five miles, was overtaken by a farmer with a team who invited him to ride, saying that he was going to Riverton, but he could carry Mr. Plumb along several miles and drop him at a point very near to Winsted. Footsore and by this time very dry and dusty, the stove man gratefully accepted the offer and proceeded along the road at a jog trot in more comfortable frame of mind. Cigars were lighted, and by way of showing his appreciation of the farmer's kindness, Plumb told him some late stories, including one which refers to the heating business and runs as follows:

Last fall, at the conclusion of the regular Saturday service in a nameless synagogue, the rabbi announced that about 40 tons of coal would be required to heat the church during the winter, and passed through the congregation with a box soliciting contributions. Almost every one dropped in something, save Mr. Isaacs, who winked in a knowing manner and refused to contribute. When the offering was counted the sum was found inadequate and the box was passed again. This time, also, Mr. Isaacs refused to give anything, and winked even more knowingly at the collector. The next day the rabbi met his parishioner and asked him why he refused to contribute toward buying the coal and why he winked in such a peculiar manner. Whereupon Mr. Isaacs lifted his hands, with palms extended, and said: "Say nottings. I'm onto you; the church is heated by steam."

Carried away by his own eloquence and the appreciation of his auditor, Mr. Plumb reached the confines of Riverton almost before he realized it, and then, thanking his benefactor, clambered down and set out on the road to Winsted, being assured that a comparatively short walk would carry him to his destination. He traveled on and on, covering perhaps 4 miles before he reached the end of his journey. Arriving at the hotel, he sat down to rest and commune with himself and incidentally to figure out just how much of a lift the countryman had given him. With the aid of a map and the assistance of the hotel clerk it was ascertained that he had been carried by the friendly farmer just 2½ miles off his regular track, and had covered exactly 1⅞ miles further than the air line distance between New Hartford and Winsted.

TRADE REPORT.

The Iron Market.

From Cleveland comes the news that lately quite a considerable quantity of Mesaba Ore from the Rockefeller interests has been placed at old figures, and that now sellers generally ask a slight advance.

The question of future increased cost is attracting growing attention among Western producers, and it is coupled with the fear that further labor troubles may develop. There is some uneasiness concerning the Lake Ore miners, and considerable uncertainty about the result of the coming negotiations between the Amalgamated Association and the union mills. As our correspondent in Cleveland telegraphs, the scales to be presented by the former will be a repetition of last year's demands. If that proves to be true there will be trouble.

An increasing number of mills have been forced into idleness through the Coal and Coke strikes, and the floods have interfered with the operations of others.

The feeling is growing general that active operations will soon begin in the Connellsville Coke region. Two of the Pittsburgh blast furnaces are getting ready to start next week. There is a growing conviction, too, that the decisive moment is coming in the Coal strike, and that work will be resumed at no distant date. But even if operations are again started it will take some time before the Coal trade settles down into its regular grooves.

No movement upward has taken place in Foundry Iron, although the growing scarcity of Southern Pig is bringing the situation very close to an actual advance.

Pig Iron.—The expected advance of freights from the Lehigh Valley to New England points, which is now $1.75, has not alone stimulated shipments but has also led to quite a number of sales, among them some to cover requirements for quite a considerable period. There is more inquiry also from the territory north of Albany, which has been so largely controlled by the Buffalo and valley furnaces, as the result of the stoppages of these furnaces through the Coke strike. Prices have not been affected, however, although Eastern Pennsylvania producers are more conservative in the sales for delivery during the second half of the year. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9 75 @ $10.25.

The two prominent features of the week in the Philadelphia Pig Iron market have been a scarcity in low grade Irons and a lighter demand for other descriptions. At $10 @ $10.25, delivered, a good deal of Iron would be taken; at $10.50 and upward buyers begin to pick and choose. As a rule holders claim to have firmer ideas, and while there is plenty of Iron at $10.50 @ $10.75 for Mill and Pipe purposes, it is not easy to force concessions, and the same may be said of No. 2 X at $11.50 @ $11.75, although, as usual, chance lots at less money are met with once in a while. General quotations for Philadelphia and equivalent points are about as follows:

Standard No. 1 Foundry X	$12.50 @ $12.75
Standard No. 2 Foundry X	11.25 @ 11.75
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 11.75
No. 2 Soft	10.75 @ 11.00

Our Chicago advices indicate an improvement in business. Better buying has recently developed, Local Iron being in very good demand, comparatively speaking. Shipping instructions are reported to be coming in at a lively rate on old contracts and new orders have been entered quite freely during the week. Negotiations are now pending for considerable quantities which are expected to be closed soon and will make the coming week a good one. Agents of Southern companies generally report business quiet, but it is known that orders ranging from 200 to 400 tons each have been placed and that one house in this way sold about 1500 tons since last report. Southern Soft Irons are now very scarce and the Silvery grade is practically out of the market. Foundries are running short of Coke, but every effort is being made to have them supplied and it is not expected that they will suffer seriously before the Coke strike ends. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10.50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.60 @ 13.50
Southern Silvery, No. 1	..... @ 11.50
Southern Silvery, No. 2	..... @ 11.00
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern. No. 2, Soft	10.00 @ 10.25
Tennessee Charcoal, No. 1	15.00 @ 15.50
Tennessee Charcoal, No. 2	14.50 @ 15.00
Alabama Car Wheel	17.85 @ 18.00
Jackson County Silvery	15.00 @ 16.00
Other Ohio Silvery	12.50 @ 13.00

The Pig Iron market in Cincinnati is reported as showing a stronger undertone. There has bren more demand for Iron than can be readily supplied, snd rather more than the usual proportion of Southern Iron selling, although the quantity is not large. There have been some small orders from the East, but the distribution of Iron in that district has been fairly liberal, considering the moderate quantity available. The main consumers of Irod are the Agricultural works, the Stove works and the Cast Pipe works, but the jobbing foundries in the aggregate are melting considerable Pig Iron, but not much in any individual instance. The Coal strike dominates the whole situation and greatly restricts trade. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke. No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

A strong feeling prevails in the St. Louis Pig Iron market. Stocks have been allowed to run down to a point which will take only a moderate demand to clean up entirely, and as a number of furnaces have closed down the conditions are ripe for a steady improvement in prices. Quotations have been advanced 25¢ ℔ ton and offers for future delivery are not being sought after. Sales during the week show decided improvement over the preceding week, and the market is in better shape than it has been for months. Quotations as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$11.00 @ $11.25
Southern Coke, No. 2 Foundry	10.00 @ 10.25
Southern Coke, No. 3 Foundry	9.75 @ 10.00
Southern Car Wheel	17.00 @ 18.00
Lake Superior Car Wheel	16.25 @ 16.50
Ohio Softeners	14.25 @ 14.50

Metal Market.

Pig Tin.—Prices have been well maintained, notwithstanding lower London quotations and ample arrivals. The drop in the market which occurred toward the close of last week was succeeded in the early days of the current week by a recovery to about 20¢, net cash, for 5-ton and larger lots, small quantities of Straits Pig from store being quoted at 21¢ @ 21¼¢. There has been, however, no sign of a broader buying interest, and it is very doubtful if the average amount of Tin has been taken up by consumers and jobbers thus far this month. The arrivals since the 1st inst. aggregate 1305 tons, 560 tons of which have come in during the past few days.

Copper.—Home trade demand is extremely commonplace, purchases being on the most moderate scale, and the export outlet smaller and even poor. Supplies are said to be liberal, though not excessive. Prices, consequently, maintain about their former level, although rumors are current of substantial offerings at lower figures than are generally quoted. For small lots of Lake Ingot dealers ask 10¼¢ ℔ lb.

Sheet Copper.—No improvement is noted in the demand for manufactured Copper. Orders continue to be on a very conservative scale, while inquiries do not show any noteworthy increase. Prices are nominally maintained in accordance with the list, but concessions on desirable orders are not unknown.

Pig Lead.—Prices in the wholesale market have been exceptionally low this week, and the market generally has a very soft appearance. Consumers are very indifferent buyers, and business has been quite tame, with no immediately favorable outlook either in Pig or manufactured Lead. Jobbers ask 3⅞¢ @ 4¢ ℔ lb for moderate quantities of American Pig, the bulk of business done favoring the lower figure.

Spelter.—Extremely low prices fail to stimulate business on home trade ac-

count. Purchases by Eastern consumers are on a very moderate scale, and offerings are entirely adequate to the present limited requirements. Jobbers' price for common Western Spelter is nominally 4¼¢ ℔ lb, but as low as 4¢ has been lately paid for small lots from store.

Antimony. — Business is fair and sufficient to keep jobbing prices steady at about 10¾¢ for Cookson's and 10¢ for Hallett's.

Nickel. — Prices are variable, with 45¢ @ 50¢ apparently a fair range on ordinary jobbing quantities.

Aluminum.—Manufacturers of Aluminum have issued a revised price list, as noted in another column. The following are current quotations: No. 1 Aluminum, over 98 % pure, 65¢ ℔ lb in small lots; 63¢ ℔ lb in 100-lb lots; 60¢ ℔ lb in ton lots; No. 2 grade, over 94 % pure, 60¢ ℔ lb in small lots; 55¢ ℔ lb in 100 lb lots, and 50¢ ℔ lb in ton lots.

Tin Plate.—The early portion of the week developed more business in Plates for both prompt and future delivery. Some substantial orders were placed by can makers, apparently to meet unexpected requirements, as the canning business is reported to have received quite a fillip on account of the fine, warm weather that prevailed in the first half of this month. The demand from the roofing trade, too, exhibited more life. Yet, in face of light stocks and scarcity in several lines of Plates, low prices continue to rule on business involving either spot goods or forward shipments, and evidence is wanting of any decided improvement in the tone of the market. The demand slacked off considerably toward the close of the week and relapsed into comparative dullness. Still there is enough of small business going around to keep the trade alive, although it is hardly up to the average for the season of the year. In the West a scarcity of Roofing Plates is noted, and it is reported that some of the Eastern Tin Plate manufacturers and dealers have lately received orders for large shipments to the West which have enabled them to clear out entire stocks of domestic Ternes. The fact that these Plates are nowhere over abundant seems to bear out this report.

A special London cable dispatch to *The Iron Ago*, dated May 24, reports on the British market as follows: Tin Plate market is somewhat firmer, but divergent views of buyers and sellers on values hamper business. There is more inclination to contract for forward deliveries and buyers offer better rates than were current a short time ago. Inquiry from Canada is especially good, owing partly to reduction in ocean freight rates. Bessemer Cokes are about 1½ pence and ternes about 6 pence dearer. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20	9/10½	@ 10/1½
Siemens Cokes, 14 x 20	10/4½	@ 10/6
Ternes, double box	18/3	@ ..
Charcoals	11/	@ 13/

Sheet Iron.—Offerings of both Galvanized and Black Iron are said to be more limited, in view of a prospective restriction of output, owing to fuel scarcity. Galvanized Iron makers are feeling for better prices, and there is talk of an advance in rates in the near future. The consumptive demand continues, nevertheless, far less than the average for the present season, with no immediate prospect of expansion. Black Iron, also, inclines to stiffen, but stocks in dealers' hands are ample for the current rate of consumption. Black Plates for tinning are becoming quite scarce, and the mills producing this material are reported to be pushed to the utmost of their capacity to meet orders. The scarcity in Black Plates has already resulted in the partial or entire closing down of some of the Eastern Tin Plate works. Stocks of imported Black Plates are also down to a very low ebb, and it is commonly reported that they cannot be replenished to any extent within, at least, six weeks from now.

Chicago Report.

Scrap.—Dealers furnish the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5⅛¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5⅛¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3⅛¢

Anthracite.—This trade shows a decided change. Local shippers are very busy. They are not only having a good demand on account of the Soft Coal famine, but are also making heavy shipments to points in the West before freight rates advance. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch.
Chicago, Ill	$5.00	$5.25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6.75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

BLACK FLAG STOVE POLISH COMPANY, Syracuse, N. Y., advise us that business has been better than they expected, the company not having shut down at all this winter or spring.

THE NEW YORK OFFICE of the McDaniel & Harvey Company of Philadelphia, C. McIntosh, sales agent, has been removed from 284 Pearl street to the Downing Building, 108 Fulton street, New York. The McDaniel & Harvey Company manufacture Harvey's Patent Clean Sheet Iron and are sole factors for the McCullough Iron Company.

CONDITION OF THE

Hardware Trade.

BUSINESS continues in moderate volume, but the fact that the trade are buying in very small quantities and more frequently than usual tends to keep jobbers and manufacturers relatively busy, although the aggregate of sales is not up to the average. Prices are without important change and the market on the whole is low and irregular. The effect of the strikes remains to be seen. This matter would be a much more disturbing factor if there were anything like a normal demand for the product of furnaces and mills. As it is, some of them can close without materially affecting the market. Collections continue sluggish.

Advices from Chicago.—The Shelf Hardware trade keeps up very well. Orders have been quite numerous the past few days, and the month now promises to be fully as good as March or April. Some stimulus to trade has been imparted by the notice of an advance in freight rates to the West. Shipments have been hurried forward on this account to a noticeable extent. Jobbers, however, hope that trade will hold up to about its present volume through the summer. They have done so much better than they expected that they are inspired to take an encouraging view of the future rather than discouraging. Staple goods are hardening on account of the advance in raw material, and higher prices are being made every two or three days. Roofing Plates are still very scarce, especially American brands, but prices are held down to old rates. The Heavy Hardware trade is quiet, not only in Iron and Steel, but in wagon and carriage stock. The recent cold snap which has injured vegetation is looked upon with some apprehension, as it may still further depress the demand from farming interests, on which the Heavy Hardware trade depends largely for its prosperity.

Notes on Prices.

Wire Nails.—The Wire Nail market continues in substantially the same condition as last week as to the volume of business, but has a decidedly firmer tone, as the manufacturers, in view of the increased cost of raw material and the uncertainty as to the supply of fuel, are naming higher prices. Most of the mills are adhering to $1.10 at mill, but it is thought that this figure can in some cases still be shaded slightly. In view of the situation there is a disposition also to take orders subject to prices ruling at the time of shipment, and another advance would not be surprising. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Manufacturers' agents report some demand from large distributors, but buyers generally are holding off until the situation clears up. Manufacturers are advancing prices on account of the scarcity of fuel and higher values of raw material. They are quoting at last advices $1.10 at mill, or about $1.20, Chicago, but agents are now instructed to take orders subject to factory acceptance. Jobbers have made two advances during the week, and now quote $1.20 for small lots from stock with no reduction for carloads.

Cut Nails.—A somewhat firmer tone has been given to the Cut Nail market by the prevailing strikes and the fact that some of the mills at least are sus-

pending operations for a time. The price of Western Nails at mill is 90 to 95 cents, the latter quotation being in most cases insisted upon, but lower prices are made in competing for Eastern business. Eastern mills are quoting 95 cents to $1 for Nails delivered on dock in New York. Small lots from store in New York are still held at $1.10 to $1.15.

Advices from Chicago.—Inability to obtain Coal has caused the Lakeside Nail Company to shut down, but they have accumulated a stock of Nails which will enable them to supply the trade if the stoppage is not too long. Sales have been good during the week. Prices are very firm at 95 cents for 55 cent average. Small lots from stock are $1.05 to $1.10.

Barb Wire.—In sympathy with other products which are affected by the strikes, Barb Wire is somewhat stronger. The market is represented by the following quotations for Four-Point Galvanized, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—An advance is expected on Barb Wire this week, owing to the scarcity of fuel at various works and higher prices of raw material. Inquiries have been fair, and in some instances large shipments have been made to the West in anticipation of higher freight rates. Factory lots of Galvanized Barb Wire are quoted at $2.20 to $2.25, Chicago, while small lots sell at $2.30 to $2.35, from stock. Painted Wire is held at 40 cents per hundred less than Galvanized.

Apple Parers.—We are in receipt of the following revised quotations on Apple Parers manufactured by C. E. Hudson, Leominster, Mass.:

	Per dozen.
Rocking Table	$5.50
Little Star	4.00
Daisy	3.50

Common Sense Lawn Sprinkler.—Stott Garden Implement Company, 136 Liberty street, New York, are manufacturing this Sprinkler. It is quoted to the trade at $12 per dozen net.

Refrigerator Fasteners — Bronze Metal Fasteners Nos. 4 and 5 have been put on the market by P. J. Conroy & Co., Paschall post office, Philadelphia. The No. 4 is sold at $8 per dozen and the No. 5 at $6 per dozen, subject to a discount of 40 per cent. to the trade.

The Premium Wringer.—The Colby Wringer Company, Montpelier, Vt., for whom Surpless, Dunn & Alder, 15 Murray street, New York, are direct representatives, have issued the following revised list of their Premium Wringer, the prices given being subject to a discount of 2 per cent. for cash:

		Per dozen.
No. 10, rolls	10 x 1¾ inches	$21
" 11, "	11 x 1¾ "	25
" 12, "	12 x 1¾ "	29

These Wringers are packed half a dozen in a case. The company's circular gives dimensions and weights of the different numbers.

Aluminum.—The Pittsburgh Reduction Company have issued a revised price-list of Aluminum, Ingot, Plate and Sheet, and Wire. The price of Plate and Sheet has been reduced 10¢ from the list printed in *The Metal Worker* of February 3, or to 80¢ base for ⅝-inch and heavier of a width wider than 3 inches and not wider than 12 inches. The Wire list has been entirely changed, as follows:

Aluminum Wire.—B. & S. Gauge.

Diameter B. & S. Gauge	Price per pound.
Nos. 9 to 14	$1.00
Nos. 16 and 17	1.05
Nos. 18 and 19	1.10
No. 20	1.25
No. 21	1.40
No. 22	1.50
No. 23	1.60
No. 24	1.75
No. 25	2.00
No. 26	2.25
No. 27	2.50

Glass.—There is no noticeable increase in the demand for Window Glass, while prices are firm and unchanged since our last report. The outlook is encouraging rather than otherwise, and additional pots are reported as having gone into operation during the past week. The opinion is expressed that tariff legislation will probably not influence the price of Glass during the present fire, and that foreign manufacturers will not import Glass largely while the action of Congress remains uncertain. New York and Pittsburgh markets are represented by the quotations for car lots of 85 per cent. discount for single, and 85 and 5 per cent. discount for double strength Glass. Small lots are quoted at 80 and 20 per cent. discount.

Old Metals.—Consumption is so restricted that the business doing in Old Metals has been of the narrowest character. Prices are weaker and the market generally dull and lacking interest. The following quotations represent about the price paid by dealers in this city for moderate lots:

Heavy Copper	℔	6¾¢
Light and Tinned Copper	℔	6¢
Heavy Brass	℔	4½¢
Light Brass	℔	3¾¢
Lead	℔	2½¢
Tea Lead	℔	2¼¢
Zinc	℔	2¢
No. 1 Pewter	℔	12¢
No. 2 Pewter	℔	6¢
Wrought Scrap Iron	gross ton	$7.00
Heavy Cast Scrap	gross ton	7.00
Stove Plate Scrap	gross ton	3.50
Burnt Iron	gross ton	2.50

Old Rags, Paper, &c.—The market is quiet, such business as is moving being chiefly in small lots. Paper mills, as a rule, are not making stock, but are running only to fill orders. When these are completed the mills stop; consequently the demand for Paper stock is limited. The prices paid for Old Rags, Paper, &c., in New York show little change, being about as follows:

No. 1 White Rags	℔	3¼ @	3⅓¢
No. 2 White Rags	℔	2 @	2¼¢
Mixed Rags	℔	@	¾¢
Blues and 3ds	℔	1 @	1¼¢
Hard Sized White Shavings	℔	2½ @	2¾¢
No. 1 White Book Shavings	℔	1¾ @	2⅛¢
No. 2 White Book Shavings	℔	1⅛ @	1½¢
Light Book Shavings	℔		¾¢
No. 1 Mixed Shavings	℔	1 @	1¼¢
No. 2 Mixed Shavings	℔	¾ @	1¢
No. 1 Printed Books	℔	1 @	1¼¢
Ordinary Mixed Books	℔	½ @	¾¢
Newspapers	℔		2-5¢
No. 1 Manila Paper	℔	¾ @	1¢
No. 2 Manila Paper	℔	⅞ @	¾¢
Bogus Paper	℔		½¢
Common Paper	℔		⅜¢
Straw Chips	℔		½¢
Binders' Clippings	℔		½¢
Jute Butts	℔	1⅞ @	2¢
No. 1 Jute Bagging	℔	1 @	1¼¢
Mixed Bagging	℔	¾ @	1¢
No. 2 Bagging	℔	½ @	¾¢
Hemp Twine	℔	2 @	2¼¢
Manila Rope	℔	2⅛ @	2¼¢
Jute Rope	℔	1½ @	1¾¢
Mixed Rope	℔	¾ @	⅞¢

Old Rubber.—The market is irregular and somewhat dull. Prices are soft, the following being the nominal quotations, New York delivery:

Car Springs, ton lots,	℔	@	$0.03½
Rubber Shoes, carloads, delivered at factory,	℔	@	.03½
Rubber shoes, less than carloads,	℔	@	.03¾
Large Hose,	ton	@	12.00
White Wringer Rolls,	℔	@	.03¾
White Syringes,	℔	@	.03¾

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Metal and Miscellaneous Prices.

CHICAGO, MAY 24, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Celland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.35
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50
Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00
Each extra cross $2.00 and 20 x 28 double these prices.
Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal extra. IC, 14 x 20 ..... 7.25
Merion, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.50

Roofing Plates.

Palm, IC, 20 x 28 ..... @$11.50
Palm, IX, 20 x 28 ..... @ 14.00
Empire, IC, 20 x 28 ..... @12.00
Empire, IX, 20 x 28 ..... @15.00
Hickory, IC, 20 x 28 ..... @ 12.50
" IX, 20 x 28 ..... @ 15.50
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska IX, 20 x 28 ..... @ 17.75
Special, IC, 20 x 28 ..... @ 14.75
" IX, 20 x 28 ..... @ 17.25
Westmoreland :
IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.00
Elwood :
IC, 20 x 28 ..... $11 50
Kenwood :
IC, 20 x 28 ..... $11.50
Furmston :
IC, 20 x 28 ..... $11.00
Juno :
IC, 14 x 20 ..... $5.75
IC, 20 x 28 ..... 11.50
Illinois, Old Method :
IC, 20 x 28 ..... $17.00
E. L.:
IC, 20 x 28 ..... $12.50
Jessie :
IC, 20 x 28 ..... $12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28 ..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20 ..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28 ..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia, IC, 14 x 20 (Stamped) 7.25
" IC, 20 x 28 (Stamped) ... 14.50
Maple, IC, 14 x 20 (Stamped) 6.75
" IC, 20 x 28 (Stamped) 13.50
Willow, IC, 14 x 20 ..... 6.50
" IC, 20 x 28 ..... 13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28 ..... 12.50
Globe, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
" IX, 20 x 28 ..... 15.00
" (Redipped), IC, 20 x 28 ..... 17.00
Old Process :
IC, 14 x 20 ..... 9.25
IX, 14 x 20 ..... 11.25
IC, 20 x 28 ..... 18.50
IX, 20 x 28 ..... 22.50
H. B. L., Old Style :
IC, 14 x 20 ..... 7.75
IX, 14 x 20 ..... 9 25
IC, 20 x 28 ..... 15.50
IX, 20 x 28 ..... 18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Gennine Russia, all numbers....13¢ net.
Patent Planished....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis.75@5%

Copper—

Ingot.

Lake.....10½¢ @ 11¢
Casting Brands.....10¢ @ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Disconnt on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.
Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)
Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.33
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special
Plain, smaller than ⅛ inch	Special
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)
Discount, 40%.

Slab Spelter—

Western Spelter ..... 4¢

Sheet Zinc—

600 ℔ casks ..... 4.50¢
300 ℔ casks ..... 4.70¢
Loose sheets ..... 4.80¢

Lead—

Soft Pig Lead ..... 4 ¢
Bar ..... 4½¢
Pipe ..... 5½¢, dis. 10¢
Block Tin Pipe ..... 35¢
Sheet ..... 6¢, dis. 10%

Solder—

½&½ ..... 13¢
Extra Wiping ..... 11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson ..... 13¢
Hallett's ..... 12¢

Wrought-Iron Pipe—

1¼ and under, Plain	60%
1¼ and under, Galv	50%
1⅛ and over, Plain	70%
1⅛ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive ..... dis 70&10%
Other sizes ..... dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list 50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles :	
Copper, 14 oz	$36.00 sqnare
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list 70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	℔ D, 2 ¢
" " Brown	℔ D, 1½¢
" " Purple	℔ D, 2½¢
" Ground in oil, B. Red	℔ D, 6½¢
" Ground in oil, Red	℔ D, 6½¢
" Ground in oil, Brown	℔ D, 5½¢
" Ground in oil, Purple	℔ D, 6 ¢
Linseed Oil, Boiled, in bbls	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8¼¢ ; kegs	7½¢
Sipe's Japan Oil, in bbls, ℔ gal	34¢
Spirits Turpentine, in bbls. ℔ gal	35½¢
Asphaltum, Trinidad Refined, ℔ ton	$45
Tarred Felt, 1 Ply, ℔ 100 ℔	$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, MAY 25, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots :
Small lots ..... ℔ D, 65¢
100-℔ lots ..... ℔ D, 63¢
Ton lots ..... ℔ D, 60¢
No. 1 Alum num (guaranteed to be over 98% pure), in ingots for remelting :
Small lots ..... ℔ D, 63¢
100-℔ lots ..... ℔ D, 60¢
Ton lots ..... ℔ D, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting :
Small lots ..... ℔ D, 60¢
100-℔ lots ..... ℔ D, 55¢
Ton lots ..... ℔ D, 50¢

Antimony—

Cookson ..... ℔ D, 10¾¢
Hallett's ..... ℔ D, 10 ¢

Brass—

Planished ..... net
Roll and Sheet ..... 25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.
List April 9, 1894.

Plain Round Tube.	Per ℔.
¾ in. up to 2 in	$0.35
⅝-in. up to ¾-in	.36
½-in. up to ⅝ in	.38
⅜-in. up to ½-in	.41
5 16-in. up to ⅜ in	.48
¼ in. up to 5-16-in	.65
3-16 in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 16, inclusive,	.28

25 @ 30%

Copper and Bronze Tubing—

8¢ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized 60%
Galvanized, Locked Joints 60%
Tin 60%

Spiral Riveted—

Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..12¢ ℔ D, net

Ingot.

Lake ..... 10½¢
Ansonia Grade Arizona ..... 10 ¢
Ansonia Grade Casting ..... 9½¢
Planished ..... net
Sheet and Bolt ..... 15¢ ℔ D, net, basis

Tubes — See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized ..... 60&10%
Lap or Slip Joint Terne 60%

Eave-Trough Mitres—

Lap or Slip Joint ..... list, net

Elbows—

Plain Adjustable—

Tin 70%
Galvanized 70%

Crimped Tubing—

Re-Tinned or Galvanized 35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

20 %

Elbows and Shoes—

Flat Crimp.

Tin 35%
Galvanized 35%

Corrugated.

Flat Crimp.

Galvanized 60%

Round or Square.

Tin 60%
Galvanized 60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ D, 2.50	2.80¢
Nos. 17 to 21	℔ D. 2.60	2.90¢
Nos. 22 to 24	℔ D, 2.70	3.00¢
Nos. 25 and 26	℔ D. 2.80	3.10¢
No. 27	℔ D. 2.90	3.20¢
No. 28	℔ D, 3 00	3.30¢
American B. B	℔ D,	4¢@4½¢

Russia, Planished, &c.

Gennine Russia, according to assortment ..... ℔ D, 11¾@12½¢
Patent Planished ... ℔ D, A, 10¢ ; B, 9¢ 5%
Craig Polished Sheet Steel ..... ℔ D 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@76&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig ..... 3¾¢@4¢
Bar ..... 4½¢
Pipe ..... 5¾¢, 20%
Tin Lined Pipe ..... 15¢, 20%
Block Tin Pipe ..... 37½¢, 20%
Sheet ..... 6¾¢, 20%
Old Lead in exchange, 2¾¢ ℔ D.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	@ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil :	
Raw, ℔ gal	@ .50
Boiled	@ .53
Spirits Turpentine :	
In bbls	@ .30½
Putty :	
In barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01½ @ .02½
In bladders	.01⅞ @ .02¼
Roofing Material, &c.:	
Asphaltum, Trinidad Refined, ℔ ton	$30.00@$35.00
Asphaltum, Rock, ℔ ton	$14.00
Coal Tar Felt, 1 Ply, ℔ D	2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft.	$1.85
Roofing Pitch, ℔ bbl	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.32@$1.33
Rosin, E. & F.....₩ bbl. $1.47½@$1.65
Rosin, G. & H.....₩ bbl. $1.80@$2.15
Rosin, I. & K.....₩ bbl. $2.40@$2.80
Rosin, M. & N.....₩ bbl $2.90@$3.10

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.h. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₩ sqr	$3.25@$4.50
Pen Argyle, ₩ sqr	3.70@ 4.00
Peach Bottom, ₩ sqr	4.75@ 5.60
No. 1 Chapman, ₩ sqr	3.90@ 4.25
Lehigh Slates, ₩ sqr	3.00@ 4.50

Vermont:

Sea Green, ₩ sqr	2.50@ 2.75
Purple, ₩ sqr	3.50@ 4.50
Unfading Green, ₩ sqr	3.50@ 4.00
Red, ₩ sqr	9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼.....13½@14¢
No. 1.....11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.

No charge for package.

Bbls., about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢
} ½ dis.

Yager's Soldering Salts.

¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔.....21½¢@22¢
Straits, pigs, ₩ ℔.....21¢@21¼¢
Straits in bars, ₩ ℔.....22¢@22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20	$7.00
Alderly, extra quality, IC, 14 x 20	6.37½
Allegheny, IC, 14 x 20	6.12
" IX, 14 x 20	6.38
Apollo Roofing, IC, 14 x 20	5.50
" " IX, 14 x 20	6.50
Atlantic, IC, 14 x 20	5.75
Bonus, Extra Coated, IC, 14 x 20	6.75
" " " IX, 14 x 20	8.25
Buckeye, IC, 14 x 20	7.00
" IX, 14 x 20	8.25
Chicago, IC, 20 x 28	11.50
Central, IC, 14 x 20	5.37½
Climax, IC, 14 x 20	5.50
Columbia, IC, 14 x 20	7.00
Dane, IC, 14 x 20	5.50
DeMill's First New York, IC, 14 x 20	5.75
" First New Jersey, IC, 14 x 20	5.50
" Mohawk, IC, 14 x 20	5.50
Dunlap's Double Dipped, IC, 14 x 20	8.25
" " IX, 14 x 20	9.50
" Domestic, IC, 20 x 28	12.00
" " IX, 20 x 28	15.00
Empire, IC, 14 x 20	5.75
Extra Central, IC, 14 x 20	5.62½
Flag, IC, 14 x 20	5.25
Fort Pitt, IC, 20 x 28	11.00
Globe, IC, 14 x 20	5.75
Hamilton's Best Redipped, IC, 14x20	9.25
" " " IX, 14x20	10.75
Hickory (Resquared), IC, 14 x 20	6.12½
Juno, IC, 14 x 20	5.75
Kensington, IC, 14 x 20	6.75
" IX, 14 x 20	8.00
Knoxall, IC, 14 x 20	6.00
Laufman's Apollo (Resquared), IC, 14 x 20	8.12
Laufman's Apollo (Resquared), IX, 14 x 20	9.37
Leominster, Extra Coated, IC, 14x20	7.25
Lion (Stamped), IC, 14 x 20	6.25
Lula, Best Charcoal, IC, 20 x 28	12.50
" " " IX, 20 x 28	16.00
Manhattan, IC, 14 x 20	7.00
Maple, IC, 14 x 20	6.50
Merchant's Roofing (Resquared), IC, 14 x 20	8.25
McKinley, IC, 20 x 28	12.00
" IX, 20 x 28	15.00
Newcastle Real Old Method, IC, 14x20	9.50
" " " IX, 14x20	11.50
Newcastle Genuine Extra Coated, IC, 14x20	8.75
" " " IX, 14x20	9.75
Newcastle Shenango, IC, 14x20	6.12½
" " IX, 14x20	7.62½
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
N. F. Old Style, IC, 14 x 20	7.50
" " " IX, 14 x 20	9.00
Old Colony, IC, 14 x 20	8.00
Optimus, Best Redipped, IC, 14 x 20	8.25
" " IX, 14 x 20	9.50
Osceola, Hand Coated, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.75
Pacific, IC, 14 x 20	5.25
Palacio, IC, 14 x 20	5.55
Pennsyl Old Method (Trehle Coated), IC, 14 x 20	8.00
Phœnix, IC, 14 x 20	5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20	9.25
Scott's Extra Coated (Resquared), IX, 14 x 20	10.75
Taylor Old Style (Resquared), IC, 14 x 20	9.25
Taylor Roofing, IC, 14 x 20	8.00
Thomson's Puritan, IC, 14 x 20	5.75
Tip Top, IC (Resquared), 14 x 20	6.62
" IX " 14 x 20	7.88
U. S. Monongahela, IC, 14 x 20	6.10
U. S. Redipped, IC, 14 x 20	8.25
Venus, IC, 14 x 20	5.37½
Vigilant, IC, 14 x 20	5.50
Waldo Redipped, IC, 14 x 20	6.75
Westmoreland, IC, 14 x 20	6.25
Wilkinsburg Redipped, IC, 20 x 28	16.00
" " IX, 20 x 28	19.00
Willow, IC, 14 x 20	6.25

American Bright Plates—

Almond, IC, 14 x 20	$6.25
Brilliant (Tissue Packed), IC, 14x20	9.00
Climax, IC, 14 x 20	6.00
" IX, 14 x 20	7.50
Florence, IC, 14x20	6.75
Hazel, IC, 14x20	5.80
Iowa, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Linden, IC, 14x20	6.50
Merchant's Dipped, IC, 14x20	11.00
Merlon, IC, 14x20	6.75
Mint, IC, 14x20	6.00
Newcastle Russia, IC, 14 x 20	7.00
" IX, 14 x 20	9.00
Newcastle Junlati, IC, 14 x 20	6.50
" " IX, 14 x 20	8.50
Newcastle Best Coke, IC, 14 x 20	6.00
" " IX, 14 x 20	7.25
Newcastle Coke, IC, 14 x 20	5.50
" " IX, 14 x 20	6.75
Palma Xtra, IC, 14x20	7.25
Phœnix, IC, 14x20	6.25
" IX, 14x20	7.75
Royal, Extra, IC, 14x20	7.00
U. S., IC, 14x20	7.25
Versailles, IC, 14 x 20	5.75
Youghlogheny, IC, 14 x 20	6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20	$7.50
20 x 28	15.00
IX, 14 x 20	8.75
20 x 28	17 50
Pontymister Grade, IC, 14 x 20	6 50
20 x 28	13.00
IX, 14 x 20	7.50
20 x 28	15.00
Worcester Grade, IC, 14 x 20	5.75
20 x 28	11.50
IX, 14 x 20	6 75
20 x 28	13.50
Dean Grade.—IC, 14 x 20	$5.37½
20 x 28	10.70
IX, 14 x 20	6.40
20 x 28	12.80
Ahercarne Grade.—IC, 14 x 20	5.25
20 x 28	10.50
IX, 14 x 20	6.40
20 x 28	12.80

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ ℔.

Melyn and Cal-land Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
" "	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC,	10x14, 14x20	$5.25@$5.35
	10x20	8.12½
	20x28	11.00
	IX, 10x14, 14x20	6.60
B. V. Grade.—IC,	10x14, 14x20	5.40

Imported Boiler Plates

IXX, 14x26..(112 sheets)	$13.35
IXX, 14x28..(112 sheets)	14.50
IXX, 14x31..(112 sheets)	16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz.....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....52½&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892.....70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks.....₩ ℔ 4¾¢
Per ℔.....5¢ @ 5½¢

It Is Reported—

Illinois.

That the Hardware store of J. A. Oliver of NEW MEMPHIS was robbed on the 7th inst. of $50 worth of Cutlery.

That the Brookline Hardware Company of CHICAGO have been incorporated, with a capital stock of $12,000. The incorporators are Alfred E. Frost, C. A. V. Standish and C. W. Nothnagel.

That the Hardware store of F. B. Rice, AURORA, one of the oldest and best established stores in that city, has been closed by the sheriff on three judgment notes, aggregating over $10,000, held by the Second National Bank. Among other heavy creditors are Hibbard, Spencer, Bartlett & Co. of Chicago.

Indiana.

That the Implement warehouse of Fogle & McCarty, LAPORTE, was destroyed by fire on the 12th inst. The fire is thought to have been of incendiary origin.

That William Brummitt & Son's Hardware store at NEW CARLISLE was burglarized on the 7th inst.

Iowa.

That W. D. Rust has purchased a stock of Hardware at CEDAR RAPIDS and has opened up a Hardware store.

That E. W. Joy has disposed of his Hardware business at WAPELLO to a new firm under the style of Hayden & Bettler.

That the store of Samuel Lemley of MELROSE was robbed on the 7th inst.

That Ferman & Kingsbury, CRESTON, have sold out to and been succeeded by Mr. Kingsbury, who will continue the business alone.

That E. S. Welch has succeeded Welch & Lazenby in the Hardware business at OTTUMWA.

Kansas.

That the business portion of the town of NORTONVILLE sustained a serious loss from fire on the 14th inst. Among the heaviest losers was C. O. Johnson, dealer in Hardware.

That $300 worth of Hardware was stolen from the store of the Hamilton-Rankin Hardware Company, ARKANSAS CITY, on the 8th inst.

That A. Sellers is now conducting the Hardware business at MCPHERSON formerly carried on under the style of Sellers & Wright.

Michigan.

That John Klooster of MUSKEGON is intending to open a new Hardware store at FREMONT.

That Knight & Decker, at GRAND HAVEN, have been dissolved, Isaac Decker succeeding.

Minnesota.

That Dickinson Bros. of VERNDALE will build a large two-story pressed brick structure at WADENA, which they will occupy on completion as a Hardware and furniture store.

That Foss & Hoode have recently entered the Implement business at ST. JAMES.

Nebraska.

That H. G. Stilwell's Hardware store at PALMYRA was destroyed by fire on the 14th inst.

New York.

That the Hardware store of Charles G. Hornung, 411 William street, BUFFALO, was visited by burglars on the 9th inst., who carried away a small quantity of Revolvers, Knives, Drills, &c.

That P. B. Cary of DUNKIRK will remove his Hardware stock to new quarters on July 1.

That the Hardware store of Alexander Ferguson of CHARLOTTE was robbed on the 13th inst. Two hundred dollars' worth of Cutlery was secured by the thieves.

That Alling, Fields & Co. is the style of a new Hardware firm at DUNKIRK who expect to engage in business about July 15.

That John W. Petry, for many years the manager of William Brodie's Hardware store at LONG ISLAND CITY, has engaged in business on his own account, having formed a copartnership with John A. Halpin (also until recently connected with Mr. Brodie), under the style of John W. Petry & Co. They have leased the building 63 Vernon avenue. Mr. Petry was also for a long period manager of the Hardware and plumbing business of his uncle, the late George Petry. The new firm will do a general Hardware and plumbing trade.

Ohio.

That Thomas Bodell's Hardware store at HARROD was robbed on the 8th inst.

That Henry Morris' Hardware store at 436 Woodland Avenue, CLEVELAND, was entered by burglars on the 8th inst., and $52 worth of Knives and Razors stolen.

Wisconsin.

That E. M. Chandler and S. D. Spiedel have entered into partnership at RICHLAND CENTER and will conduct the Hardware business at the old Chandler stand. The firm name will be Chandler & Spiedel.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

A sober, reliable man can obtain a situation in a shop now tinning malleable and cast iron; one who understands running a grease pot preferred and capable of turning out first-class work. Frank Baldwin, 33 South street, New York City. May 26

Good STOVE SALESMAN for Iowa and Wisconsin to sell a large line on commission "Commission," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 26

A first-class PLUMBER who can do steam and hot water fitting. Geo. A. Anthoine, 24 Alfred street, Biddeford, Maine. May 26

SUPERINTENDENT for stove foundry running 150 molders; must be first-class manager, with good ideas and thorough practical knowledge of all the details of the business, capable of taking full charge; address, giving experience, references, age and salary expected, "X. Y.," No. 526, office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

A first-class man who thoroughly understands TIN and SHEET IRON WORK and has some knowledge of furnace work and plumbing; must be temperate; only those competent and able to furnish good recommendations need apply; steady work to the right man; give age. Adams Hardware & Furniture Company, Lamar, Mo. May 26

An ASSISTANT to a FOREMAN in a cornice shop in Philadelphia, Pa.; an active, industrious man with experience; also first-class SHOP WORKERS on copper cornice work; give references. "Copper," office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

A good TIN and SHEET IRON WORKER who has a fair knowledge of plumbing and iron piping; man with some experience in a hardware store preferred; must furnish reference from previous employer; steady job to the right man; small New England city. "Steady Job," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

A good STOVE PATTERN MAKER will find a steady job; state experience had and wages wanted. "G. R.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 19

Practical ENAMELER; one fully conversant with all branches in enameling cast and sheet metal ware and who fully understands the construction and operation of plant required; give experience and references; applications from experimenters will not be considered. "Manufacturer," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

A practical and experienced SUPERINTENDENT for a tin plate mill; one who is competent to oversee construction of mill and who can manage same when built. Address, stating experience, "Natural Gas," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

SUPERINTENDENT for a stove works; one capable of taking full charge of all departments; none but a first-class man of long experience need apply. Address with reference and state salary expected, "C.," No. 519, office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

SITUATIONS WANTED.

Two first-class PLUMBERS, A No. 1 men, desire to leave the city and can furnish best city reference; can do steam and gas fitting. A. Gillisgie, 135 West 101st street, New York City. May 26

Steady position desired by a young man, 25 years of age, who has had five years' experience as a first-class iron stove pattern filer; steady, sober workman. Frank Hamburger, 958 Jefferson street, Buffalo, N. Y. May 26

By a good TINSMITH who understands plumbing, gas fitting, roofing and all inside and outside work; country preferred. H. Rose, care L. Bloom, 180 West Main street, Norwich, Conn. May 26

By a reliable young man as PLUMBER or ASSISTANT; recently graduated from the New York Trade School; can furnish the best of reference from former employers; also understands lead burning. "B. C. B.," Greene, Chenango Co., N. Y. May 26

First-class PLUMBER wants position anywhere; 12 years' experience. Jo. Rielly, 504 West Twenty-eighth street, New York City. May 26

By a TIN and SHEET IRON WORKER; 15 years' experience. S. Bissick, 119 Suffolk street, New York City. May 26

CORNICE, SKYLIGHTS and ROOFING; a young man having had three years' experience in the office of a large concern in New York City, also superintending outside work, desires permanent position in similar capacity; competent to keep books; position acceptable either in New York City or out of town; references and security at your disposal. "Advertiser," 172 Seventh avenue, New York City. May 26

As SALESMAN or TINNER with hardware, plumbing, tinning or stove house; good bookkeeper; moderate salary; references; can do any shop work. "L. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

By a TINSMITH and ROOFER, at inside and outside work. H. Thron, 110 Orchard street, New York City. May 26

By a STEAM and HOT WATER FITTER; first-class workman; sober. John S. Keefe, 316 West Thirty-fifth street, New York City. May 26

By a STEAM FITTER, Cornelius Cornell, 31½ Macdougal street, New York City. May 26

By a PLUMBER with three years' experience; good knowledge of steam and gas fitting; strictly temperate; town or city. Richard Ingalls, 706 Congress street, Lowell, Mass. May 26

By a first-class PLUMBER; ten years' experience at the trade; city or country. "J. G.," care of Miss Kennedy, 1221 Third avenue, New York City. May 26

By a TINSMITH and ROOFER; good knowledge of plumbing; can do all kinds of jobbing and outside work; city or country. "F. M.," Box 112, Thomaston, L. I., N. Y. May 26

By a competent man with 25 years' experience at tin, sheet iron and copper work, hot air furnaces, steam and hot water heating and plumbing; can estimate on work; have had charge of a shop; best of references; wages moderate. H. M. Hoffman, 14 Sixth street, Minneapolis, Minn. May 26

As STOVE MOUNTER, by an A1 man of 20 years' experience; all branches of the business; no objection to going South or West. S. M. Newkirk, 9 Depot street, Middletown, N. Y. May 26

On the road by a thoroughly experienced IRON, STOVE and HARDWARE SALESMAN, with over 12 years' experience; west of Mississippi River; wide acquaintance with trade to Pacific Coast; age 33; best references. "W. S. B.," 610 E. Sixth street, Leadville, Col. May 26

As FOUNDRY FOREMAN or SUPERINTENDENT; thoroughly competent, with 15 years' experience; can furnish very best A1 references. "Foundry Foreman," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 26

As TINSMITH and ROOFER by a young German, 25 years of age; willing to work; can do inside and outside work; with or without board; 12 years' experience. Jos. Dangas, care of Jacob Maak, 1213 First avenue, New York City. May 26

By June, by a FOREMAN and CULLER of seven years' experience as such; last five years with one firm; has had extended experience in contracting, getting out and putting up cornice, skylights and other sheet metal work; has had 21 years' experience all told at the trade; is married and strictly sober and wants a position where ability and worth will be appreciated. "F. M. W.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 26

By a practical CORNICE and SKYLIGHT MAKER; first-class cutter; thoroughly understands all kinds of sheet metal work; capable of taking charge of work inside and outside; wages moderate; best of references; New York or Brooklyn preferred. "Cornice Maker," office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

By a TRAVELING MAN of 12 years' experience, visiting the stove, tinware and hardware trade in Eastern Pennsylvania; can furnish first-class reference as to character, ability, &c. "Penn.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

By a first-class TIN and SHEET IRON WORKER; capable of doing roofing and general jobbing; inside and outside worker; 15 years' experience; steady work desired; $15 a week; married; sober. A. Siegel, 169 East Ninety-sixth street, New York City. May 26

By a first-class TIN and SHEET IRON WORKER; good general jobber; fair steam and hot water fitter and plumber; well up in heaters and ranges; 30 years' experience; sober and reliable; A1 reference. "J. O. P.," 2396 Third avenue, Room 131, New York City. May 26

By a practical, all around mechanic in all branches of the Hardware business, competent to design and make metal patterns, dies, tools, jigs, &c.; nine years as foreman in the above branches; good references. "Mechanic," P. O. Box 150, Harvy, Ill. May 19

A practical BRASS MOLDER, 25 years' experience on steam and water work, plumbers' supplies and general jobbing, desires a position to take charge of shop running from five to ten molders; can break in help; sober, steady man; good reference; location no object. "Brass Molder," 68 Beech street Paterson, N. J. May 19

Steady work desired by a good TINSMITH at furnace work, roofing and general jobbing; 20 years' experience; married. 11 South street, Troy, N. Y. May 19

As FOREMAN in tin and sheet iron works by thoroughly competent man; can manage any number of men judiciously. Charles Harvey, 251 Fourteenth street, Buffalo, N. Y. May 19.

By a competent man of 12 years' experience in the STEEL RANGE business, in all its branches. Harry Hellman, 516 Johnson street, Covington, Ky. May 19

By a good TINNER and GENERAL JOBBER at inside and outside work; steady and temperate; willing to work for moderate salary; city or country. S. Klinberg, 258 Delancey street, New York City. May 19

By a thoroughly competent TINSMITH; experienced in pipe, jobbing, pump work, hot water and steam heaters; capable of taking management of shop; steady, reliable and can come well recommended; at liberty June 10, or can come sooner if imperative. J. D. Francis, Bridgeport, Conn. May 19

By a young man as SHEET IRON WORKER ROOFER add JOBBER; sober; wages moderate; six years' experience. "T. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

By a practical PLUMBER of 18 years' experience, on new or overhauling work, to take charge or work journey work; first-class workman, city or country. "Emmett," care of E. Moran, 181 East 111th street, New York City. May 19

By a CORNICE CUTTER; can furnish brake. "Cornice Cutter," care of Harter House, Anderson, Ind. May 19

By a first-class TIN and SHEET IRON WORKER; used to country work; can do roofing, furnace and pump work, general jobbing and slating; 12 years' experience at inside and outside work. J. Ditchfield, 171 Passaic street, Trenton, N. J. May 19

As FOUNDRY FOREMAN by a thorough mechanic of 25 years' experience in all branches of foundry work; first-class at cupola management and reliable where strict economy is desired; strictly temperate; first-class references. "Eastern," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

A HOT WATER and STEAM FITTER, a first-class mechanic, competent draftsman and estimator, having had seven years' practice, also a fair plumber, wishes to have a steady position the year round. W. W. Hawley, Soldiers' Home, Sandusky, Ohio. May 19

By a good TIN and SHEET IRON WORKER; steady job the year round. W. Zepp, 19 Gold street, Bridgeport, Conn. May 19

An American mechanic, married, 35 years old, temperate and reliable, wants steady position and good wages; anywhere; city or country; tin work in all branches; furnace, range and heater, mantel setting, cornice and skylights; 20 years' experience; reliable man; state wages. David Dotson, 43 Ormond place, Brooklyn, N. Y. May 19

By a practical PLUMBER and HOT WATER FITTER; married and temperate; best of references; will go to any part of the country; please state wages; steady work desired. "R. B. C.," care of John Flynn, 331 West Seventeenth street, New York City. May 19

Steady employment by a thorough PLUMBER and GAS FITTER; understands roofing and spouting; strictly sober. The Russell House, 76 East Eagle street, Buffalo, N. Y. May 19

By a good ROOFER and GENERAL JOBBER; ten years' experience. J. L. Daniels, Bath, N. Y. May 19

By a PLUMBER, eight years' experience. Arthur Wiskers, 1460 Third avenue, New York City. May 19

By a first-class PLUMBER, 15 years' experience; best of references. Scott, 163 East 104th street, New York City. May 19

Young man with two years' experience in the retail hardware business, four years with the largest wholesale firm in the West, and well posted on hardware and prices desires a position; unquestionable references. Box 23, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 19

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A full set of Tinsmiths' Tools and Machines in good order. One set pipe fitting tools, used very little, consisting of vise, stocks and dies cuttiug from ¼ to 2 inch pipe. Building for shop situated on main street in business center of town of 3000 inhabitants, about 30 miles from New York. All the above, including stock of pumps, stoves, lead and iron pipe, tin, copper, iron, zinc, stove pipe and elbows, dampers, soil pipe fittings, solder, resin, roofiug nails and good will of business, for the sum of $500 cash. Address at once "GOOD OFFER," No. 526,
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A good second-hand Brake (Cornice), Square Shears, Punching Machine and full set of Bench Stakes and Machines. A. A. MARTIN.
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Set of Tinsmiths' Tools. Almost new and in first-class condition. Price $150.
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FACTORY AT WHITESTONE, L. I., FOR SALE (40 minutes from N. Y.). With boilers, 15 horse-power engine, machinery, tools, &c. Price $7000, worth $10,000; terms $3500 cash, balance on mortgage at 6 per cent., if desired. Located on L. I. R. R. and the Sound. Very advantageous for any light manufacturing, such as metal work, novelties, hardware, &c. Lot 50 x 100 facing on two thoroughfares; three-story brick building 30 x 90, with boiler and engine annex building. Address
"FACTORY,"
P. O. Box 2718, New York City.

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by a wholesale Stove house a showy and cheap Hard Coal Base Burner in car lots. Address
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wishes to sell his interest in a well established hardware, stove, plumbing and jobbing business doing a business of about $20,000 per year; located in a large manufacturing town in Eastern New York. A rare bargain on easy terms to the right party. Address
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office of *The Metal Worker*, 96-102 Reade street, New York.

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Sample Room, Eastern Agency of full line Gas Ranges and Heaters, wants active partner with moderate capital. Wholesale business. Address "GAS RANGES," office of *The Metal Worker*, 96-102 Reade St., N. Y.

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FOR SALE, through the death of the proprietor, the entire estate and business of the late Earnest Chanteloup of Montreal, Canada. This is an opportunity rarely met with. Only small amount required in cash. The business is situated in the heart of the city and embraces iron and brass foundry, iron and brass finishing, electrical, plating, stamping, tinsmith, coppersmith, steam fitting, plumbing, buffers', carpenters' and painters' departments. The business is at present continued by the various foremen under a general foreman. This establishment enjoys the confidence of the railway companies, governments, banks and other corporations in the country. Balance sheet to date shows a net capital surplus in the business of $248,000. In first instance apply only to
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SUPREME COURT.—In the matter of the voluntary dissolution of the W. F. Washburn Brass and Iron Works, a corporation, &c., notice is hereby given that at the factory formerly occupied by said corporation, at corner of Dock and River Streets, in the city of Yonkers, Westchester County, N. Y., on Wednesday, the 6th day of June, 1894, at 10 o'clock A.M., I shall sell at public auction all the plant and machinery of said corporation, consisting of machine tools, special tools, nickel plating outfit, patterns, flasks, furnaces, shafting, pulleys and the entire mechanical equipment of said corporation for the manufacture of plumbers' fine brass work. Terms made known at sale.

JOSEPH M. STOUGHTON, Receiver.
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The old established Roofing and Cornice Works with machinery, tools and stock of Wasson & Co., Albany, N. Y. A great opportunity for a practical man. Price low. Inquire of
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One Stow's 31 inch Geared Power Squaring Shear. Will cut 3-16 in. iron, or lighter. Used very little. Call on or address
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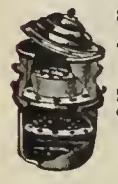
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"Will you," he asked in trembling, hopeful tones, "be mine?"

"Hardly," she responded, in a rich bass voice.

"You have given me hope that you would," he pleaded.

"How?"

"By almost promising that you would not reject me."

"That is another thing," she said in a softer tone. It gave him great hope.

"Ah, then, you will be my wife?" he exclaimed, with a brighter light in his face.

"Hardly that, I think," she told him with the chill again in her voice.

This made him almost desperate.

"Why do you treat me so?" he implored. "What would you have me do?"

She drew herself up proudly, almost defiantly.

"Do?" she exclaimed. "Do? Ask me if you may be my husband."

And he loved her so that he obeyed her, and he obeyed her ever after.—*Detroit Free Press.*

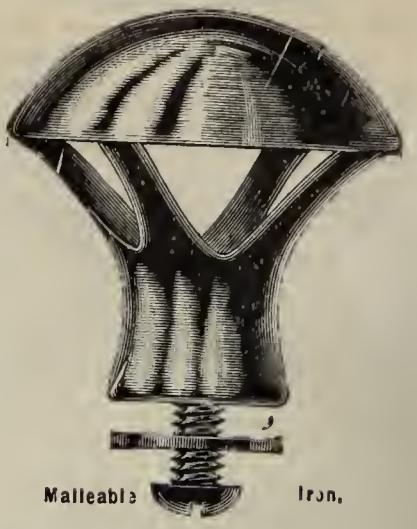
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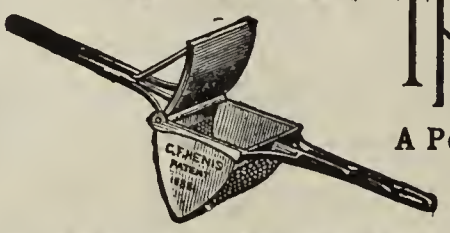
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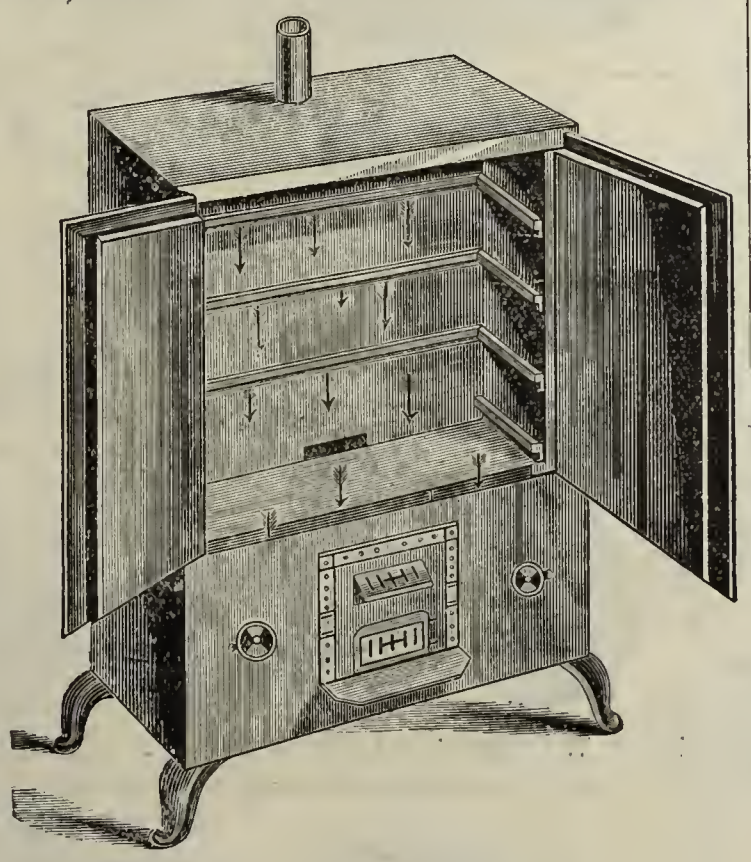
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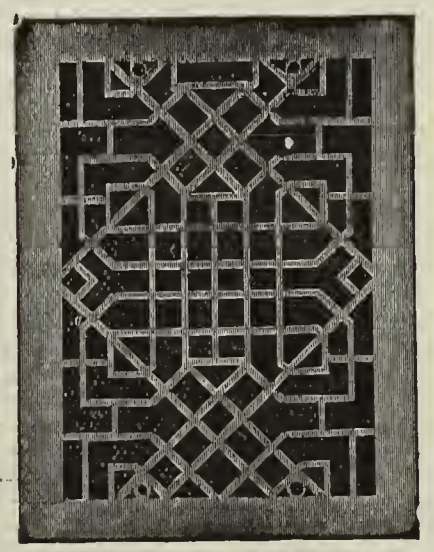
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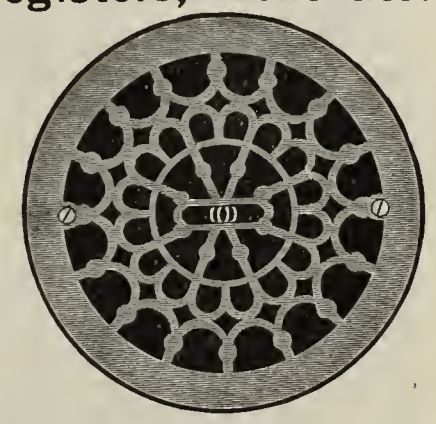
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Registers, Ventilators.



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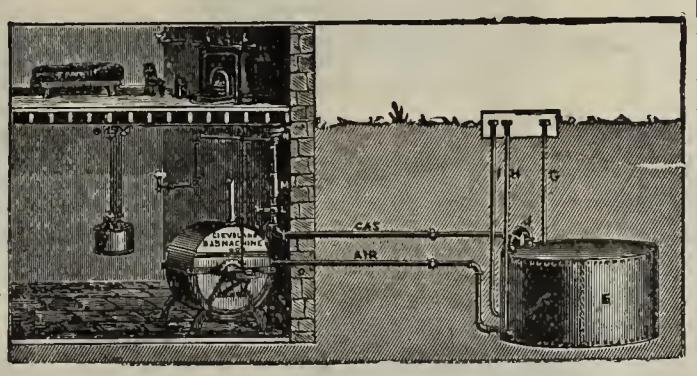
BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H.

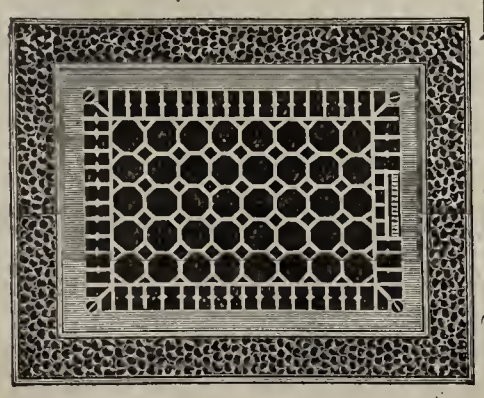
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82 Champlain St., Cleveland, Ohio.

Please send for **Reduced Price** List and Catalogue.

We manufacture an Improved **GAS MACHINE** for lighting suburban and country Residences, churches, halls and factories; it is also used for cooking with perfect success. We also make Special Machines for furnishing gas for canning factories, and running Gas Engines.





Registers and Ventilators.

SEVENTY SIZES,

ALL STYLES,

NEW AND ELEGANT DESIGNS.

Manufactured by

The F. B. Fox Register Mfg. Co.,

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A. O. SCHOONMAKER,

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158 William St. - NEW YORK.

NEW HAMPSHIRE MICA IS THE BEST.

The F. E. BELDEN MICA MINING CO.,

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A New Alloy.

Many attempts have been made to secure an alloy of aluminum and platinum that would be of commercial value. According to an exchange, the measures taken to that end have at length proved successful. The alloy is said to be of a handsome yellow color and is described as suitable for protecting steel knives, razors and the like from rusting. In appearance it is not unlike gold alloyed with 5 per cent. of silver, and it contains only a very small percentage of platinum. It is, therefore, not an expensive metal, and will doubtless be extensively used as a substitute for gold plating for cheap metal mugs and desert services. It is applied electrolytically. The bath consists of a solution of sodium aluminate, to which is added platinum cyanide dissolved in potassium cyanide solution. The article to be plated is immersed in this bath and attached in the ordinary way to the cathode or negative terminal of the battery, while a block of carbon or sheet of platinum serves as the anode or positive terminal.

A Sudden Drop.

"I see," said the grocer, thoughtlessly, for he had forgotten that the man with the ginger beard was sitting behind the stove, "I see that the temperature dropped 20° in 15 minutes in Texas the other day."

"I don't call that nothing," said the man with the ginger beard. "I remember when they was a party of us campin' up in the Black Hills that the temperature drapped so sudden that one of the mules in the outfit, which was in the act of kickin', was caught an' froze that way, an' stood with its heels in the air two days. We had a thermometer, but the cussed thing went back on us, so I can't exactly say jist how much of a drap it was."

"Oh, yes," said the school teacher, "it is a well-known fact that at a temperature of about 40° below zero the mercury freezes and hence cannot register."

"That wasn't it at all, young man," said the man with the ginger beard, with fine scorn. "The durn mercury drapped so quick that the friction made it red hot and busted the glass."—*National Standard.*

Kept Up to His Work.

It is generally the easiest thing in the world to drive a horse without spirit, but there is one recorded instance, says an exchange, where a stage coach driver covered himself with glory by doing just that thing. He was an old timer, this driver, and one afternoon in the days of long ago he and his coach and four came rattling up to the tavern door like an avalanche. As the coach stopped one of the horses dropped dead.

"That was a very sudden death," remarked a bystander.

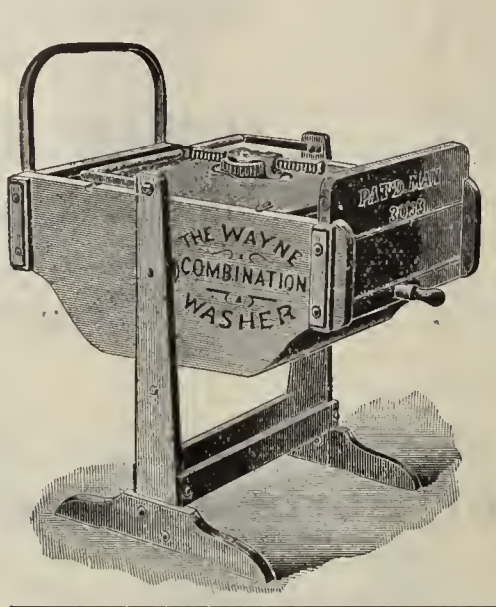
"That sudden!" coolly responded the driver. "That 'oss died at the top of the hill 9 miles back, sir; but I wasn't going to let him down till I got to the reg'lar stoppin' place."

— From a Novel.—"The notary, meanwhile, as is his custom, walked up and down the garden, with his hands on his back, eagerly perusing a newspaper."—*Demorest's Magazine.*

— "No, I won't take water from any one."

"Then you must be made different from the ordinary sponge."—*Raymond's Monthly.*

THE WAYNE **Combination WASHER**



Operates one third easier than any other machine. takes less water, is the simplest and in all is warranted the best washer of the large family of washers now on the market.

No Dealer Should be Without it.

For Prices and Discounts write

Anthony Wayne Mfg. Co.,

FT. WAYNE, IND.

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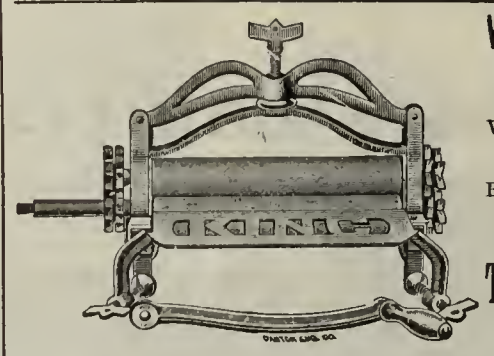
Afford to sell your lady customers that which does not give satisfaction? Washing clothes brings out the strongest criticism of a machine. To meet this was designed

The Boss,

Which will withstand all criticism. It does its work so well, so thoroughly clean and so rapidly, that complaint is never made. Such is the machine you ought to sell. Write for pamphlet describing how washing should be done and what to use.

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New York Office, 107 Chambers St., John T. Ryan, Mgr.



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SHOULD BE USED ON EVERY

Stove, Range, Furnace, Heater and Boiler,

as they hold the heat back, retaining it just where it is wanted, with no smoke or gas in the room, saving 25 per cent in fuel.

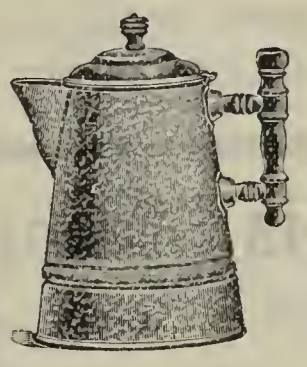
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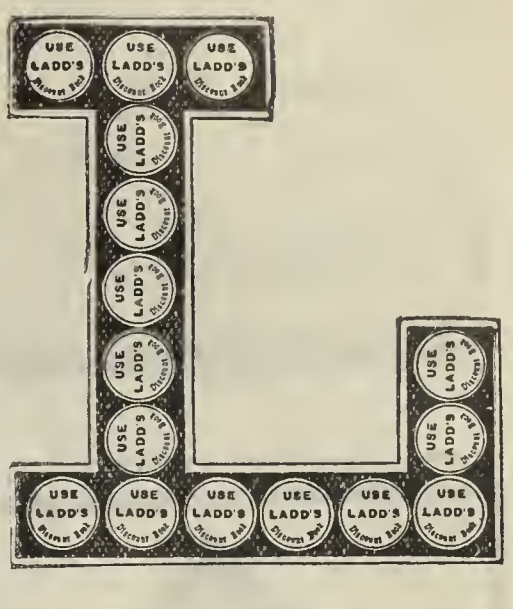
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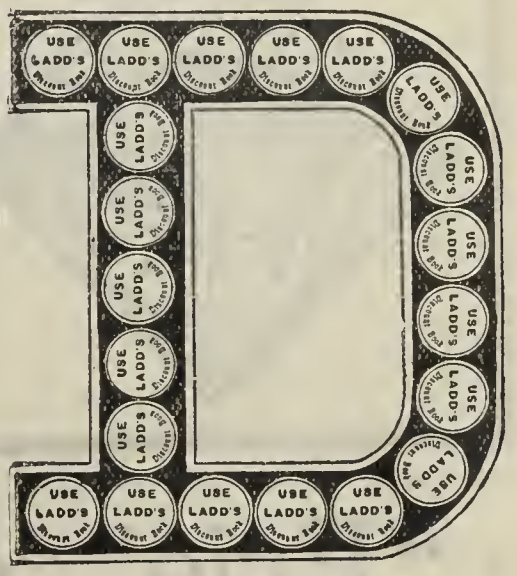
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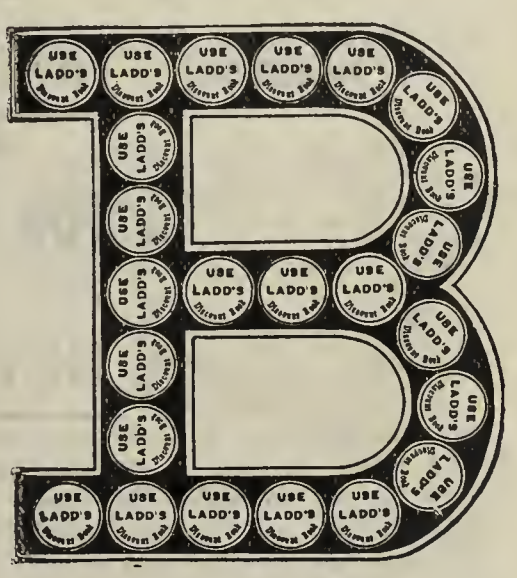
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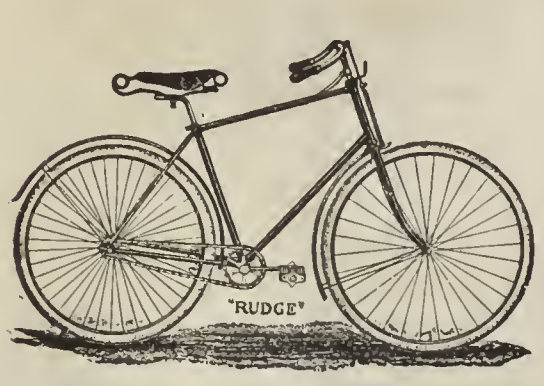
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This TEA KETTLE is made of "PURE METAL," all in one piece. No SPOUT to melt off. No SEAMS to open. No chance for LEAKAGE. Wi l not RUST or CORRODE.

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The Greatest Marvel of the Age.

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IT IS THE

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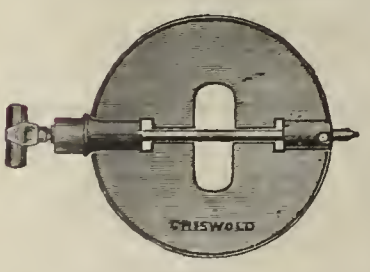


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THIS KETTLE is made of "PURE ALUMINUM," and is CAST, which allows making the BEST SHAPE with the RIM on BOTTOM; this equalizes the heat and PREVENTS BURNING. Not obtainable on thin stamped ware. For PRESERVING it has NO EQUAL. FRUIT ACIDS WILL NOT AFFECT IT. No ENAMEL to FLAKE OFF. No PLATING to WEAR OFF. But still more wonderful, it WILL NOT BURN. Oatmeal, Rice, Puddings, etc., can be cooked in this Kettle without SCORCHING. Finer than silver, for it will not Tarnish or Corrode. Stiff, Firm and Indestructible.

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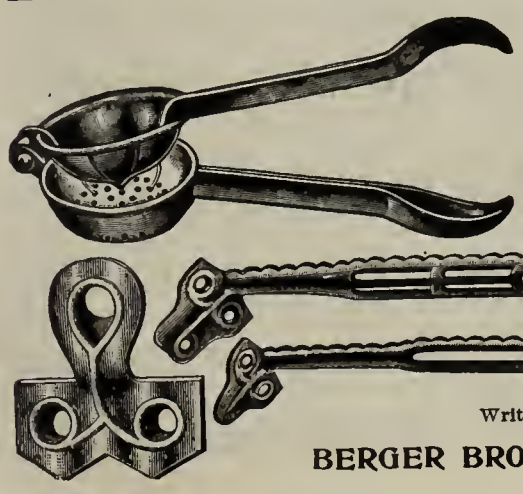
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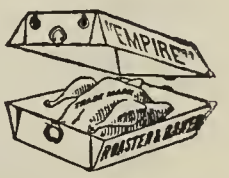
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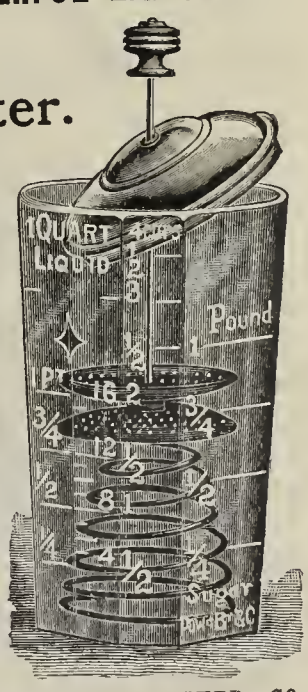
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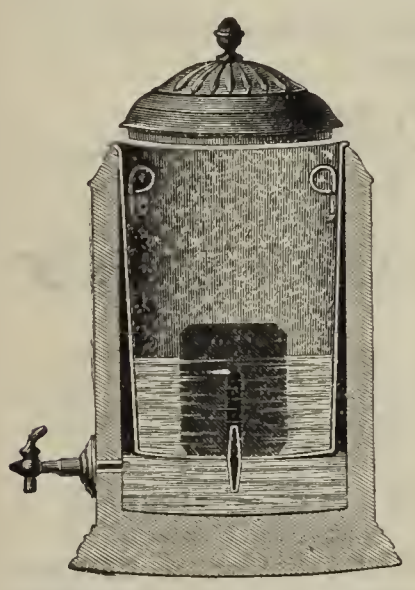
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——WITHIN REACH OF EVERY FAMILY.——

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Filter Cylinders Only, Fitted with Carbons.

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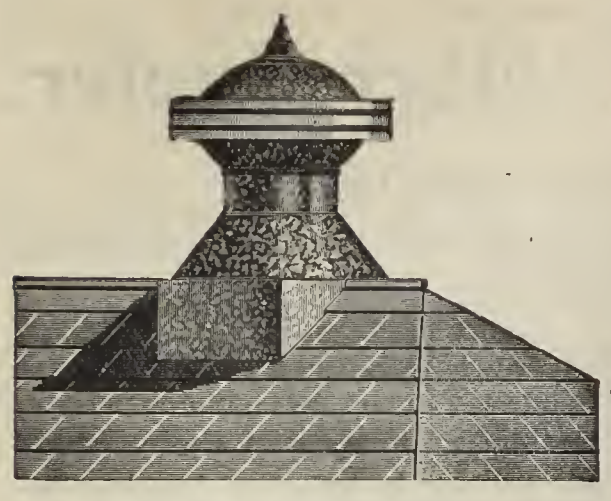
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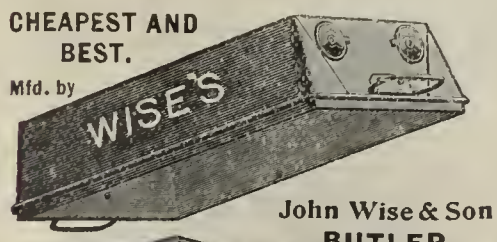
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THERE **RUTLAND LINING** WHY
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IT FITS ANY STOVE AND IS CHEAP.
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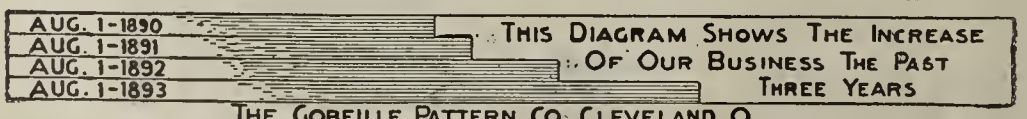
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SOME OF ITS ADVANTAGES ARE:

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It is done with a natural motion of the hand.
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It has an agitator that will not grind foreign substances through the wire netting.

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A notable instance of moving a large building is given in *Le Genie Civil.* It was the removal at Rouen, France, of a large timber and iron shed, 164 feet long, with a 97-foot span, over a distance of several hundred feet. The structure was made up of 12 trusses, supported on double posts at each end, and the total load to be shifted amounted to about 180 tons. The crucial part of the undertaking was the lifting of the 24 supporting posts at one and the same time, and it was indispensable also that this raising should be accomplished in a manner which would not in the least degree alter the relative positions of the posts.

One circumstance favoring the undertaking was that the slope of the ground over which the shed had to be moved was slight, and that the posts when in their new position would require raising only to the extent of about 10 inches. The mechanical appliances necessary, therefore, were comparatively simple, comprising only some winches, cables and screw jacks, some strong blocks and the special trucks which had to be built to carry the posts in transit. Rails and sleepers, necessary to complete the outfit, did not add greatly to the expense.

The first operation consisted in laying a track underneath each line of posts and then building around each post a truck on to which, subsequently, the posts were lifted. As soon as all the trucks had received their loads they were coupled together by iron rods so as to transmit the traction in the line of the posts and also to preserve the proper distance between them. Somewhat beyond the far end of the distance to be traversed two piles were driven into the ground almost in line with two rows of posts, and at each side of these piles another and smaller one was driven, to serve as the fixed points for the cables used in hauling. The latter, starting from these, passed successfully around pulley blocks on the two heavier piles, then around blocks fixed to the leading trucks, and finally were wound on a winch placed inside of the building. A graduated plank was laid down along the whole length of the route to aid in securing uniformity of progression in all the trucks, and the whole operation was carried out expeditiously and successfully.

—Ex-Necessitate. — Tottie: "I'm twins."

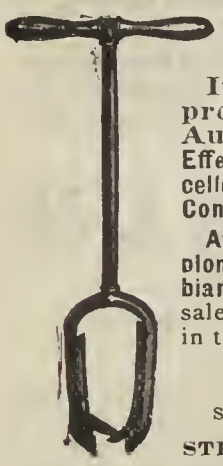
Van Brush (softly): "You mean, my dear, that you are one of twins."

Tottie: "No, I don't. I'm both. The other one's dead."—*Brooklyn Life.*

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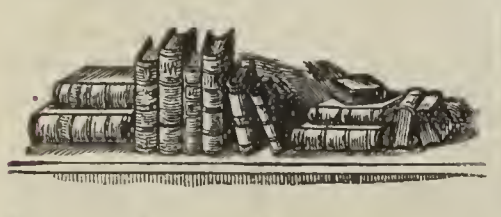


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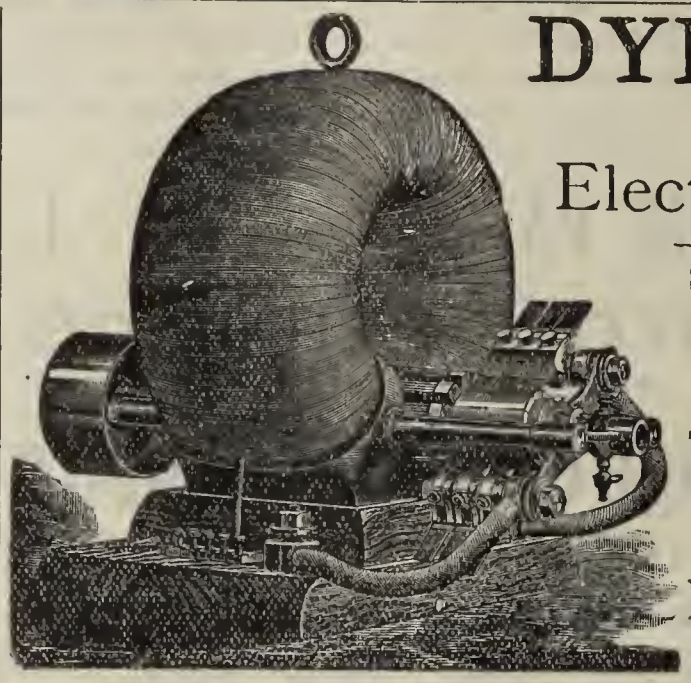
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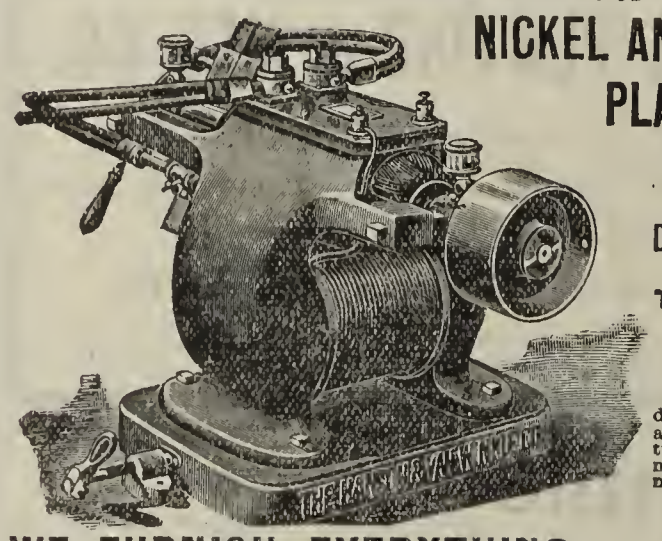
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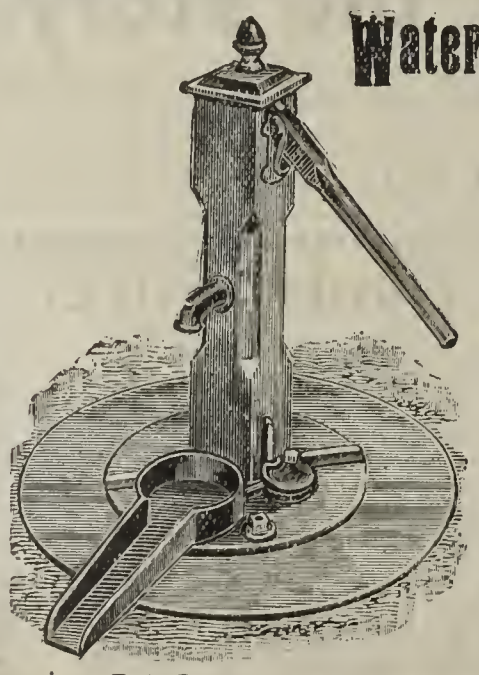
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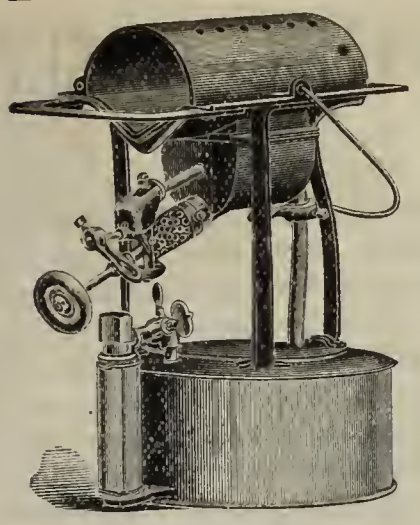
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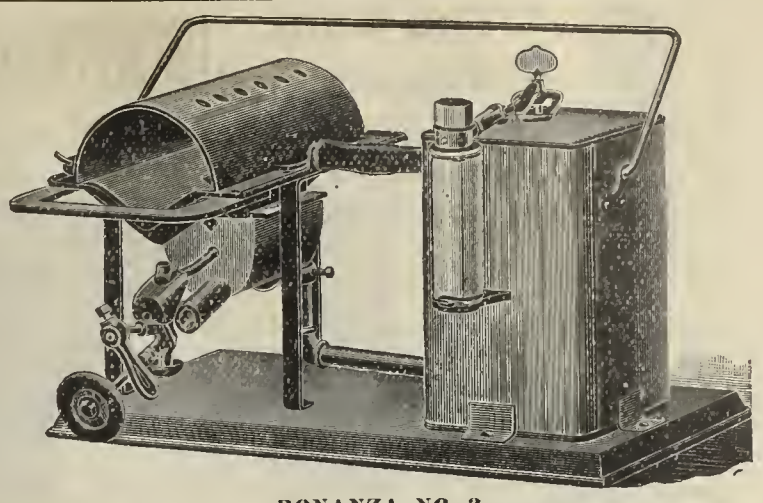
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BONANZA FURNACE

For tinners only.

PRICE $6.

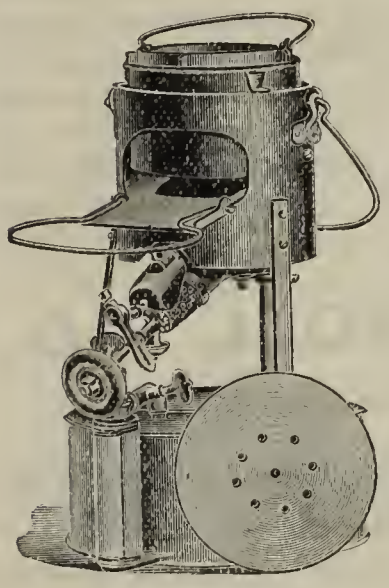
Hinged arch top. Galvanized steel with brass top tank. Best furnace for roofs or cornice work. Will heat the largest coppers. Cannot blow out. Rubber pump handle.



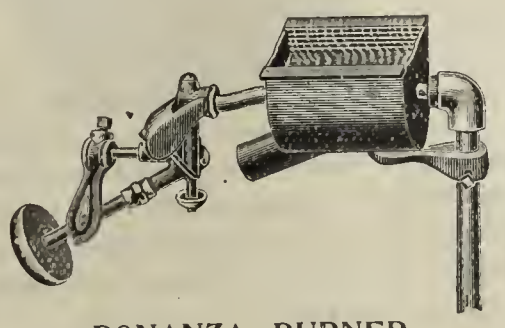
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No. 2 BONANZA

Is for plumbers and tinners. Price $6.50, including lead pot and casing for plumber. Alone, price $6. Tank and burner same as No. 1. Bonanza No. 3 same as No. 1 except the arrangement of parts.



NO. 2 BONANZA.
For Plumbers and Tinners.



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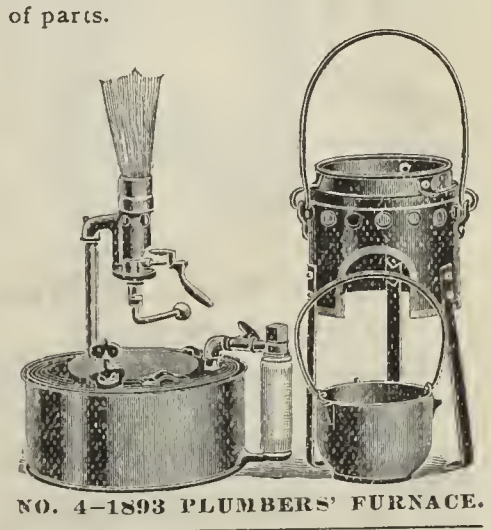
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What's the Matter? THIS IS!

The "DONOGHUE" Patent Soldering Copper Handle,

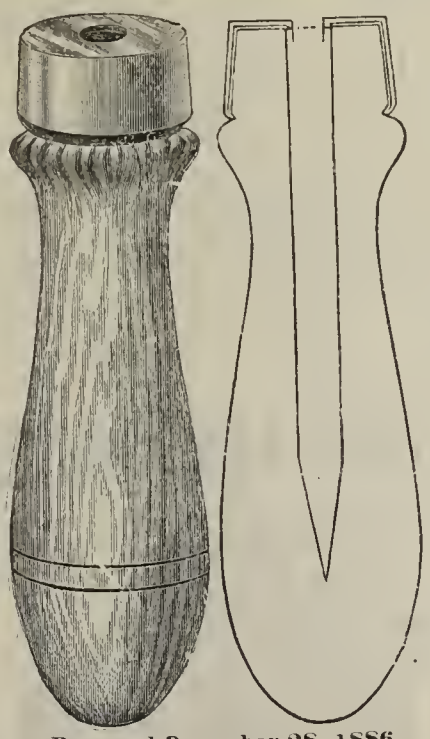
The end of which is covered by a Cap Ferrule crimped on securely, is the ONLY Patent Soldering Copper Handle ever successfully placed on the market.

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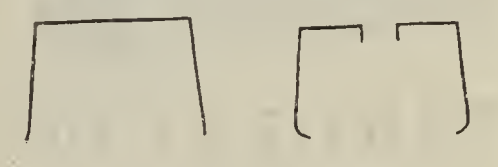
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Ask your Dealer for them.

Samples by mail 15 cents per pair.



Patented December 28, 1886.

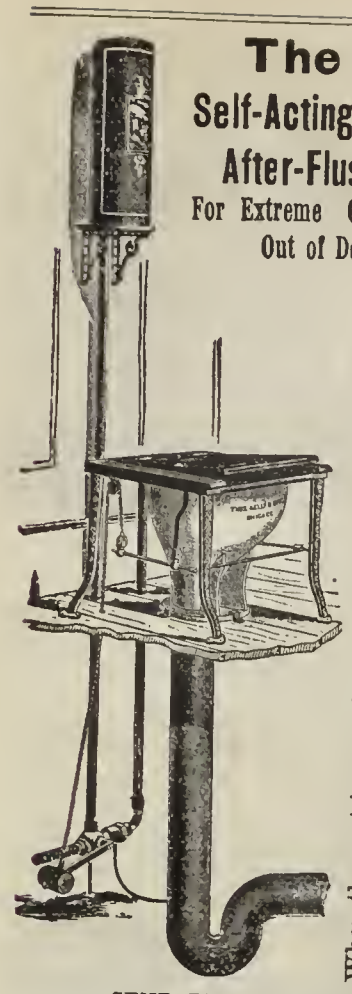


This is a section of the ferrule, showing the way it is crimped into the handle and around the tang of the soldering copper.

The Handles are put up in boxes of one dozen each, and are made in two sizes. No. 2 for one, two and three pound coppers. No. 4 for four, five and six pound coppers.

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The Cleveland Rule & Handle Co., Cleveland, Ohio.



The Kelly Self-Acting Frost-Proof After-Flush Closet.

For Extreme Cold Places and Out of Door Work.

When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

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— Mrs. O'Hagan: "I don't like the looks of the b i r-d."

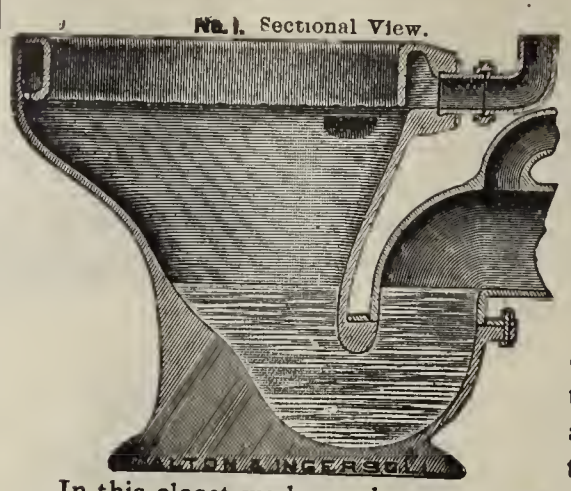
Street Vender (with suppressed anger): "Are yer a buyin' a turkey for its looks or its flavior? [Ironically.] If I'd a knowed you'd a wanted a pooty bird I'd a filled me wagon wid birds o' paradise." —*Life.*

— Too Much.—Algy: "Why, this dog knows as much as I do!"

Miss Kiddenham: "Don't you think $3 was a big price to pay for him?"—*Puck.*

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(TRADE-MARK.)



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The bowl contains a pool of water 7 x 6 inches. This is a much larger pool of water than has ever been obtained heretofore in the Short Hopper principle; and until now it has been considered an impossibility to construct a Short Hopper with a large standing pool of water that would discharge its contents. This we do in the *Boston Hopper* with the same amount of water that is required to flush an ordinary Short Hopper.

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If You Wish to Avoid

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Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence** of quality.

If by chance you do not think these points, or the saving of money, objectionable,

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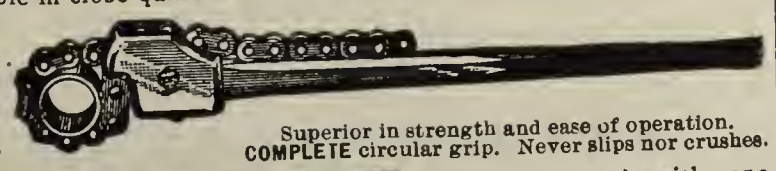
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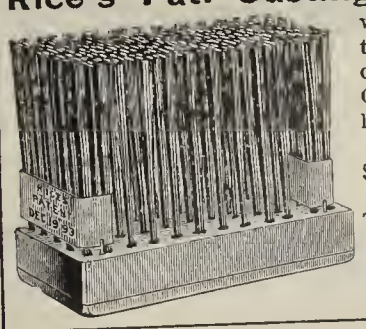
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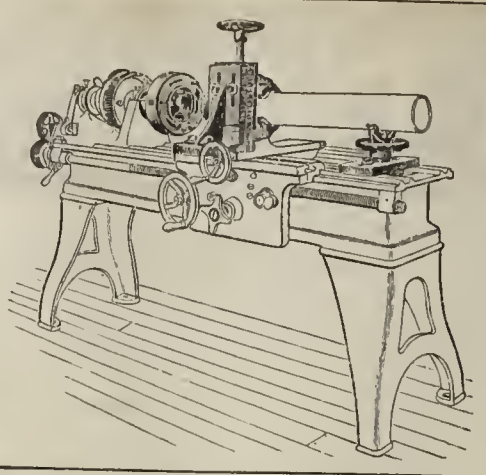


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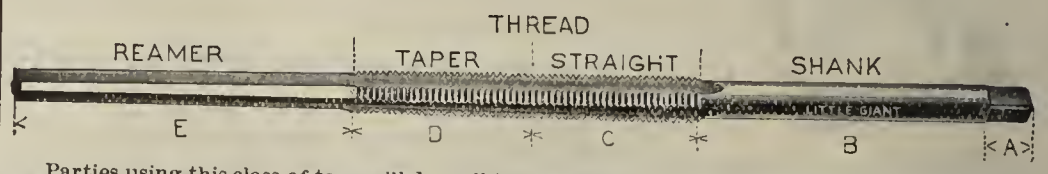
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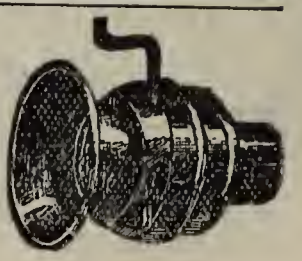
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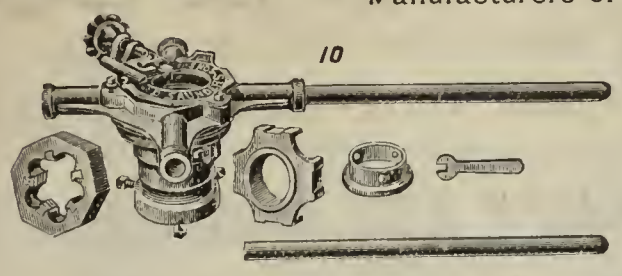
204 FULTON STREET, NEW YORK.
Manufacturers of
Speaking Tubes, Whistles, Elbows, Oarl Annunciators, Bell and Electric Wire Tubing.

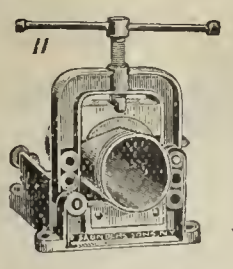
Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.



D. SAUNDERS' SONS,

Manufacturers of



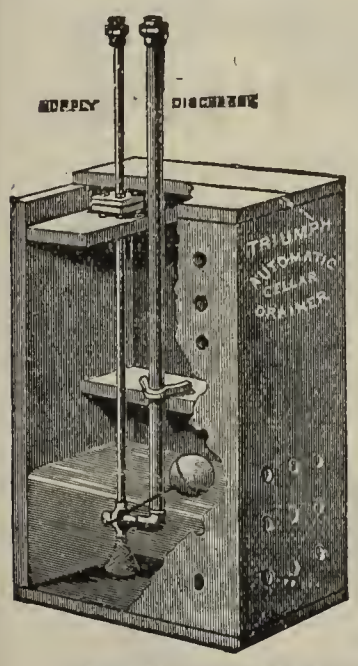


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FOR **LARGE PIPE.** These stocks have *CUTTING OFF ATTACHMENT,* and both Vises and Stocks are Malleable Iron. Light, strong and of superior design and finish; also *PIPE THREADING MACHINES* ¼" to 16", Tapping Machines, &c.

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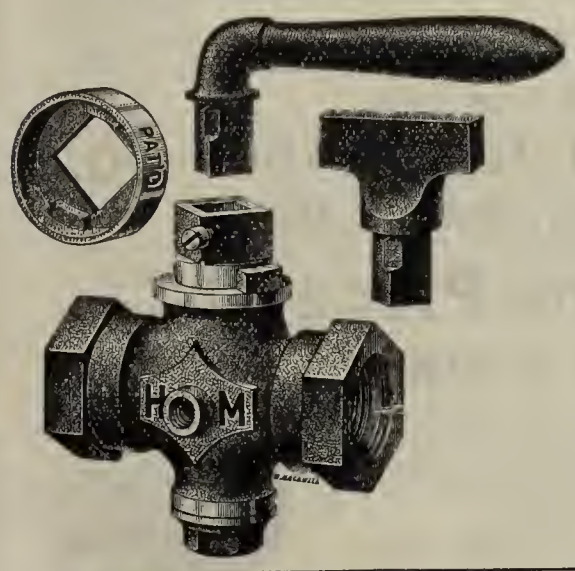
The Triumph Automatic Cellar Drainer,

For draining cellars, excavations, furnace pits, &c. Cheaper than drain pipes or any other known method. Operated by attaching it to the water connection, which gives it the requisite power. Perfectly automatic in its action and requires no attention whatever. Simple in construction. Not liable to get out of order, neither will they rust nor corrode. Hundreds in operation giving perfect satisfaction. Write for circular, price-list and gilt-edge testimonials. Correspondence solicited. Please mention this paper.

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216 N. Holliday St., Baltimore, Md., Sole Mfrs.

Pat. May 19, '85. Pat. May 26 '85. Pat. July 14, '85. Pat. Aug. 8, '86. Pat. Nov. 23, '86.



MUELLER'S

PATENT

STOP AND WASTE COCK

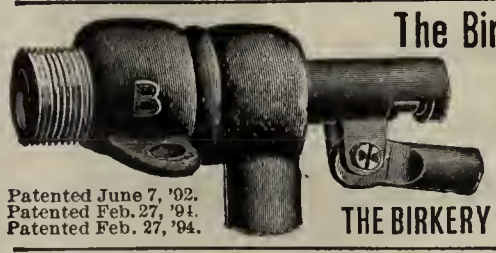
Can be used as either right or left hand, Tee or Lever Handle or Socket. Perfectly ground. Tested at 200 pounds water pressure and guaranteed not to leak.

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The Birkery High Pressure Ball Cock

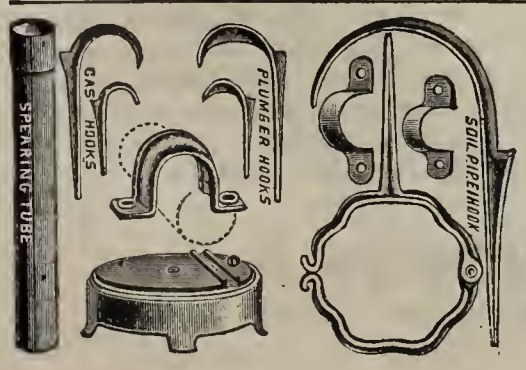
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It will not Sing or Hammer.

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AN immense stock of wrought patented steel and malleable Pipe Straps, Hooks and Clamps on hand; also Valves and Plungers, Ventilators, Speaking Tubes, Sheet Iron and Registers.

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JOINT WIPING,

FOR BEGINNERS IN PLUMBING,

WITH THIRTY-FIVE ILLUSTRATIONS.

43 PAGES. **PAPER, 25c.**

This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

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Ample instructions are given on preparing the pipes previous to wiping the joints, with full descriptions of all tools and appliances used.

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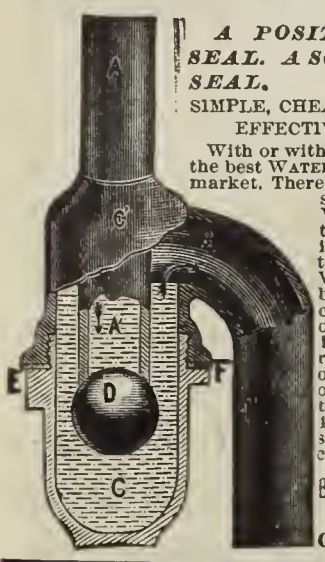
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THE BOWER

SEWER GAS TRAP.



A POSITIVE VALVE SEAL. A SOUND WATER SEAL.

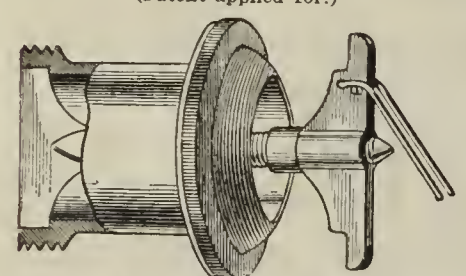
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With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 18-page pamphlet sent free on application.

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MADE in two styles, to suit iron and lead pipe.
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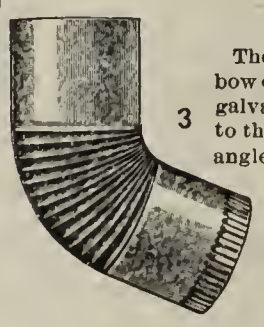
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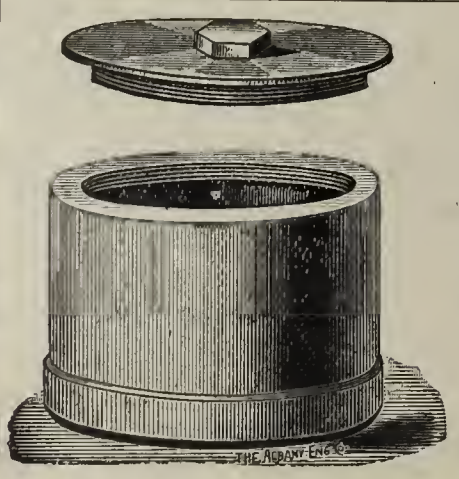


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A Common Sense Trap Screw Ferrule.

The body is of cast iron in regular pipe sizes, fitting the Hub neatly and making a good wall to calk against. The **COVER** being of **BRASS** cannot unite with the iron and corrosion is prevented by the use of Graphite. A Common Sense Article at half the cost of brass.

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The Original Expanding Conductor. Has been used for years and Thoroughly tested in all the Principal Cities and Towns of the United States, and is specified by Architects generally Throughout the Country. Furnished to the trade in 9 feet lengths with **SOLDERED JOINTS. Also the Improved Corrugated Conductor with JOINTS PATENT FASTENED. Solid and Reliable.**

Together with Patent **STAMPED ELBOWS** and **SHOES.**



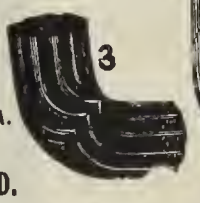
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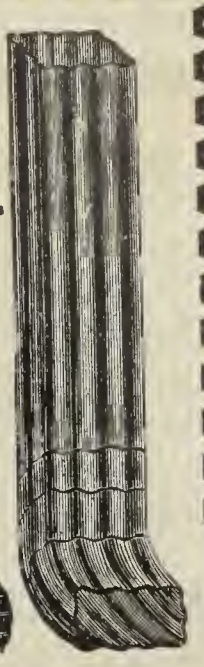
Manufacturers

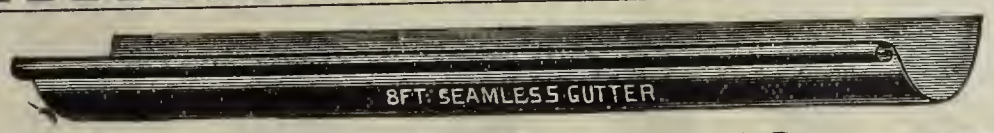
Office and Works, 237, 239 and 241 Bread St., - PHILADELPHIA, PA.

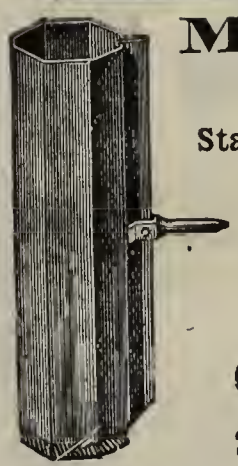
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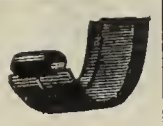
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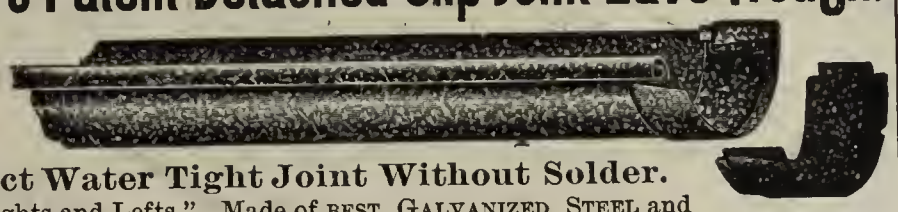
GALVANIZED IRON CORNICES.

206 Robinson St., ALLEGHENY, PA.



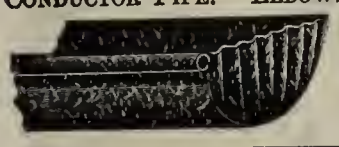
Holton's Patent Detached Slip Joint Eave Trough.

10 FEET LONG.



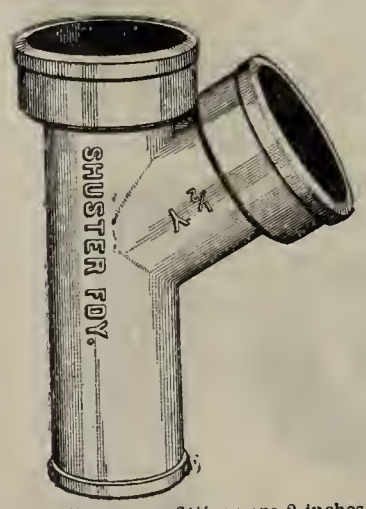
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Sizes:

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Standard, medium and extra heavy weights.

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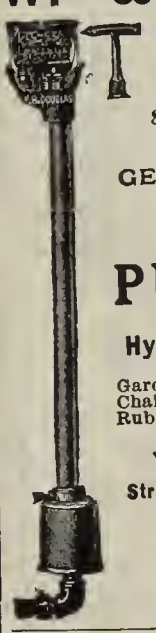
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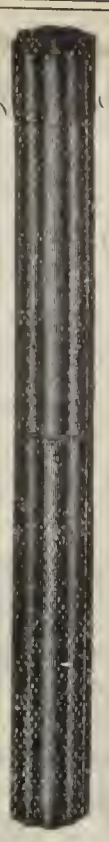


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Improved Corrugated
EXPANDING CONDUCTOR.



It combines all the advantages of the Corrugated Conductors now in use, with the following improvements.

Each 10-foot length is a single piece, the short joints not being soldered, but locked together, so that the joints cannot break apart.

The coupling or slip joint does not diminish the size of the pipe inside.

The galvanizing is free from dross or impurities.

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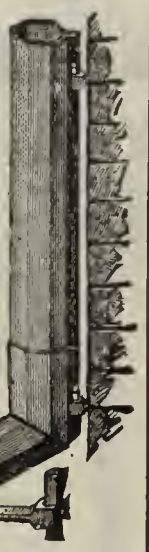
231 Lake St., Chicago, Ill.

MANUFACTURERS ALSO OF

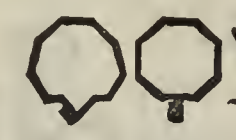
Ritchie's Spiral Pipe,

Standard Speaking Tube.

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THE STANDING SEAM allows of an easy and secure fastening, keeping the pipe far enough from the wall to make any overflow from the eave pipe or head run down the spout, and not the wall; and will open, in case of freezing, so as to prevent bursting, and still remain double-locked and water-tight.



Made in 6-foot lengths of a single sheet of SOFT STEEL.

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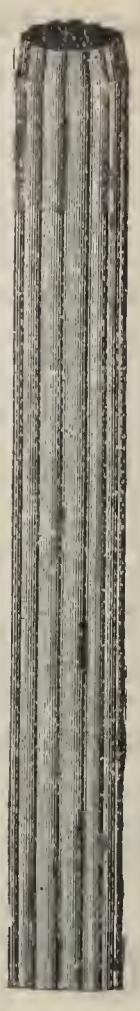
The Irwin & Reber Expanding Water Conductor Pipe has been extensively used through the United States and Canada for the past ten years and has proved itself to be the best in the market. Send for Price-List.

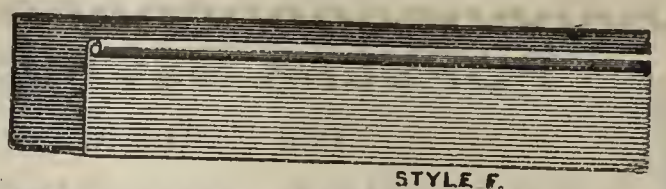
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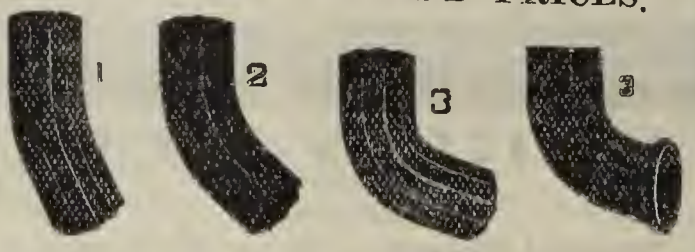


STYLE F.

Clark, Quien & Morse,
W STREET, PEORIA, ILLINOIS.
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PLECKER'S
Corrugated Conductor,
Galvanized Eave-Trough,
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We make the best goods in the world and our prices are reasonable.

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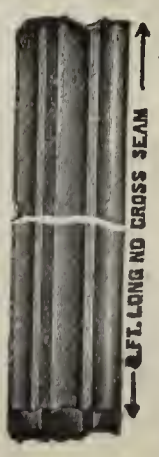
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OF GALVANIZED IRON AND COLD ROLLED COPPER.



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Put up in rolls of 100 square feet, each roll 60 feet long by 20 inches wide. The rolls are perfectly straight, with cross seams every 8 feet. Seams are thoroughly soldered during the process of coating.

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MERRY'S OLD METHOD Roofing Plate.
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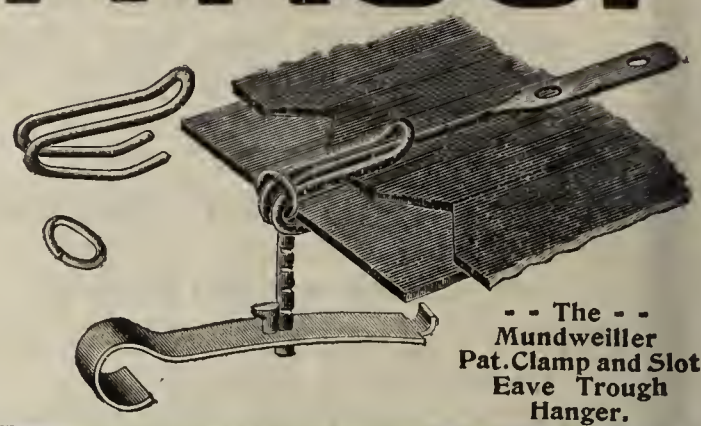


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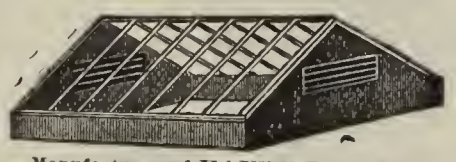
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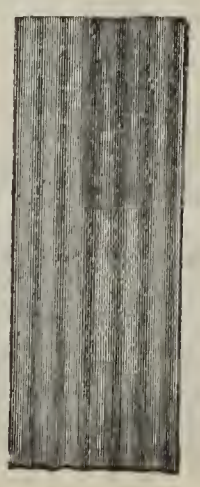
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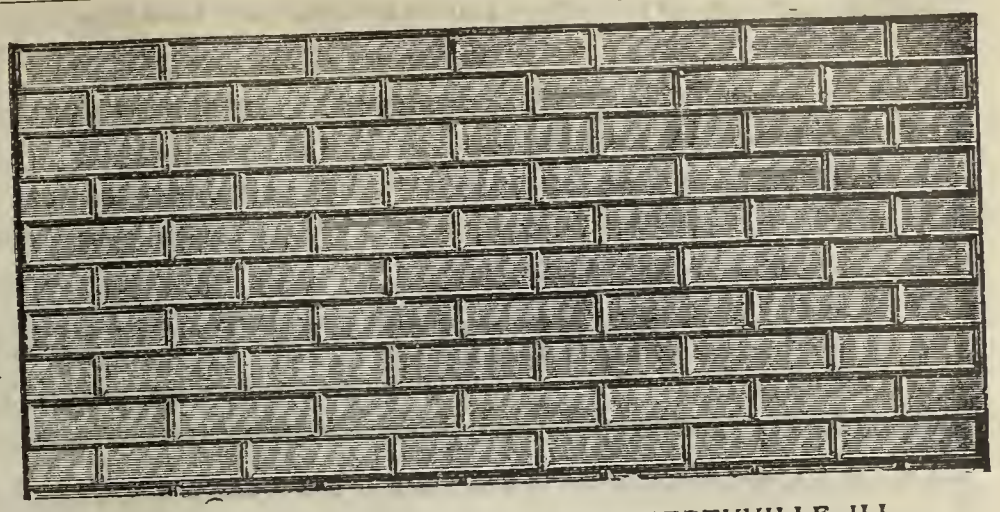
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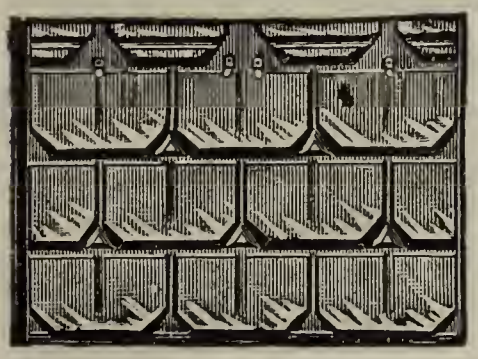
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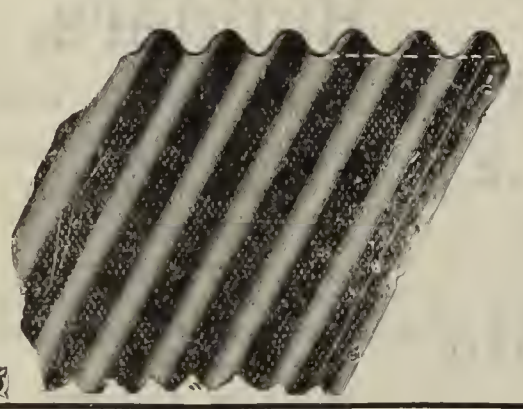
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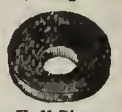
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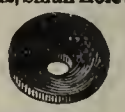


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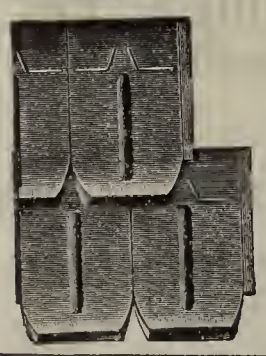
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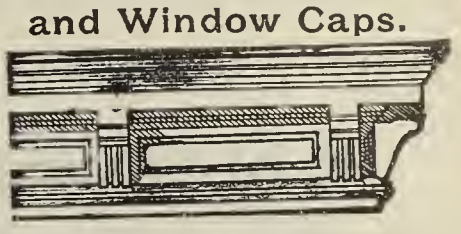
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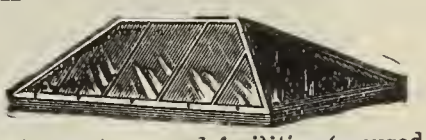
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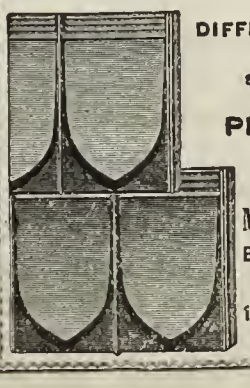


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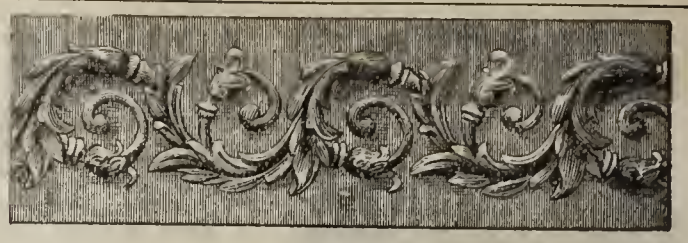
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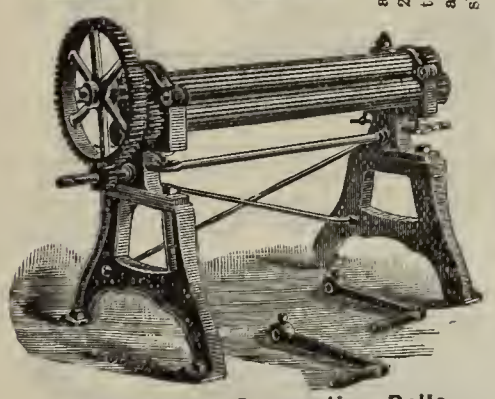
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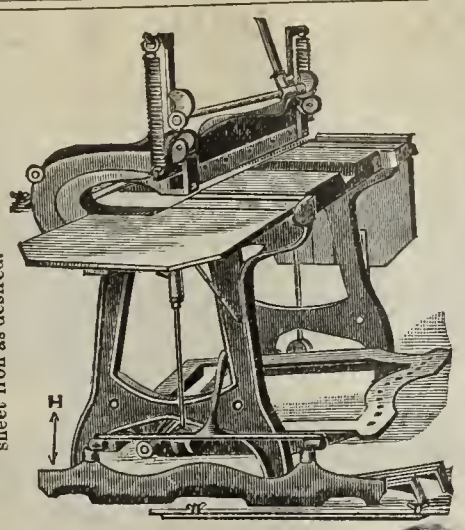
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and Stock Shears. (7) different sizes, from 200 to 1000 lbs., for light or heavy work; 6 to 15 in. throat punch. A general purpose tool adapted for punching and cutting bar and sheet iron as desired.



Crimping or Corrugating Rolls.

Are made in different sizes with fine or coarse corrugations, also designed for curving if desired.



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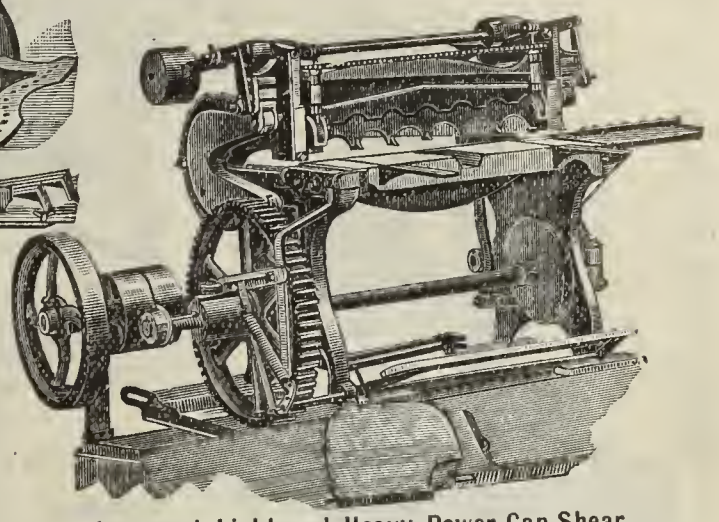
12, 15 or 18 in. throat, for slitting wide sheets as desired and regardless of length. Are made in suitable sizes for light or heavy work. With the Patent Lever Attachment can cut up to No. 16 and 14 gauge. Three different style Squaring and Slitting Shears, also Plain Square Shears all sizes up to 10½ feet long.

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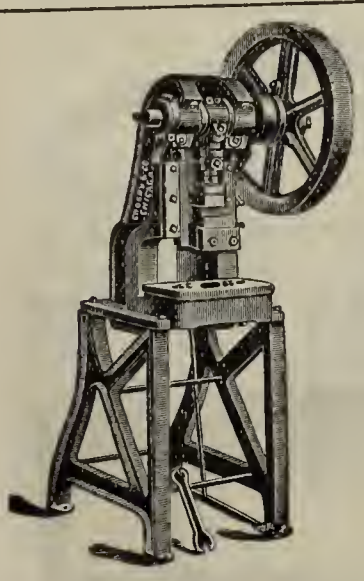
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12 to 21 inch throat, for slitting wide sheets. (4) different styles and (8 different lengths up to 10½ feet long to cut No. 8 and lighter. Special design to cut 3-16 inch to ½ inch plates. Are provided with Automatic Hold-down, Automatic Clutch and Patent Drop-leaf Tables with Trimming Gauge.



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— GEORGE: "You would marry the biggest fool in the world if he asked you, wouldn't you?"

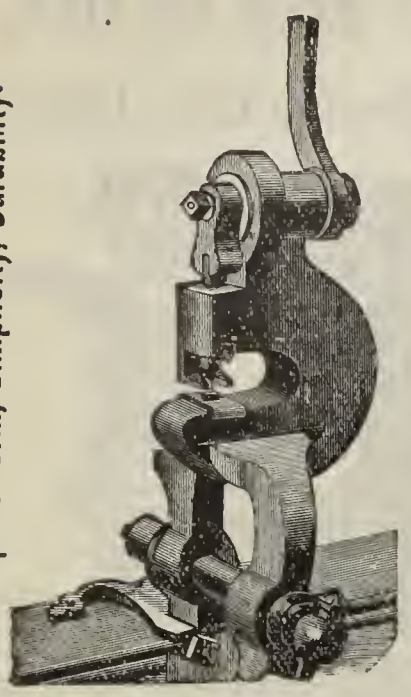
Ethel: "Oh, George, this is so sudden."
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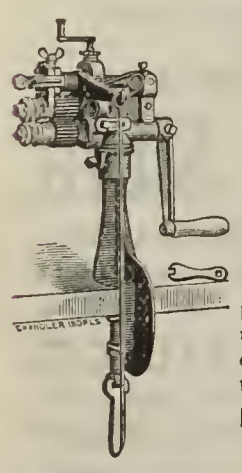
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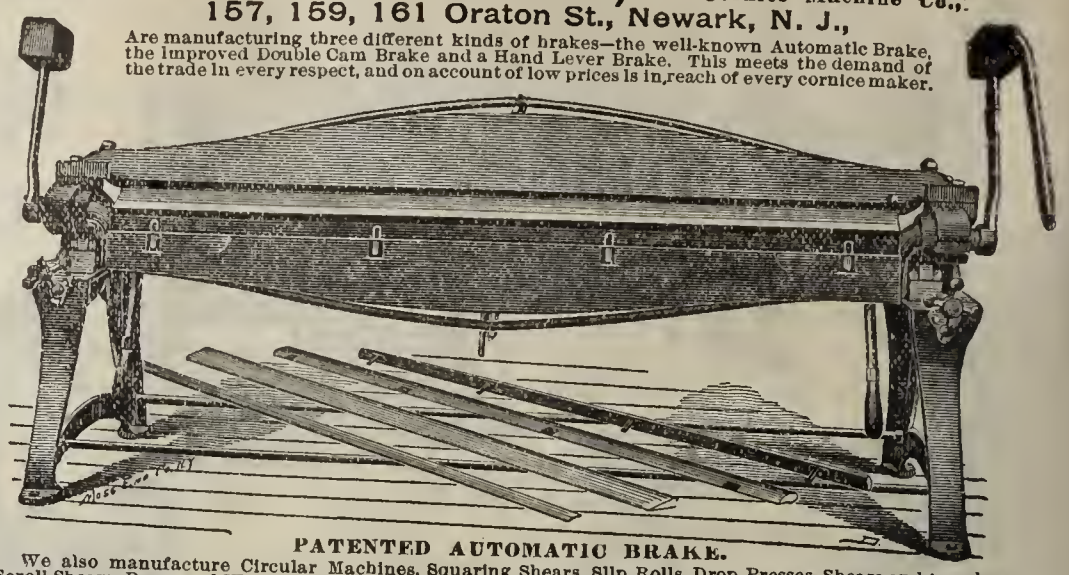
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Every pair warranted. Ask your jobber for them or send to us direct.



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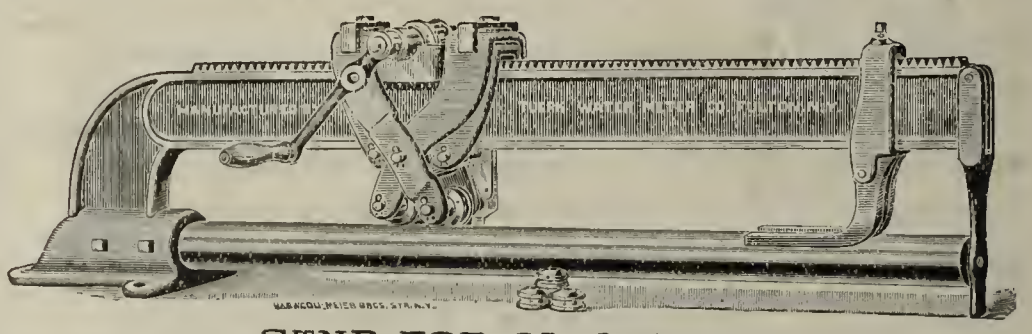
This shows a joint of pipe crimped with the Columbian.

Manufactured by

RUTH, PATTERSON & RUTH, ALLIANCE, O., U. S. A.

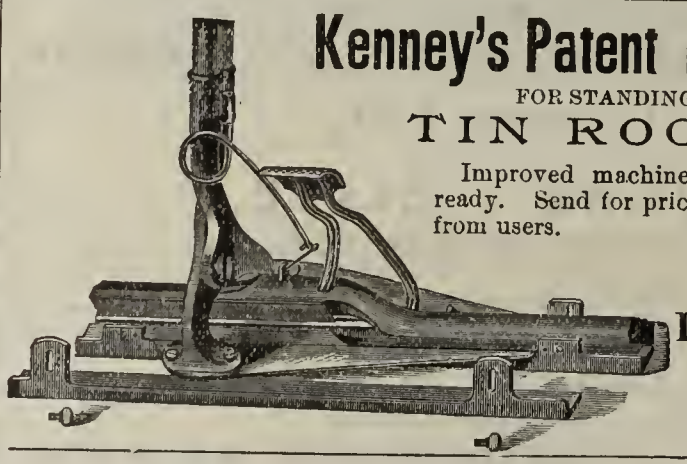
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Kenney's Patent Double Seamer

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Improved machine, from new patterns, now ready. Send for prices and flattering testimonials from users.

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We invite your attention to this new Former for Tinners' and Sheet-Metal Workers' Rolls, on which we claim rapidity of operation, superior construction and durability. The back roll is moved by eccentrics instead of screws, and can be changed instantly from the smallest circle to the passing of a straight sheet. It will flare metal easier and better than any other machine in use. You can get closer to front roll, therefore bend a smaller circle. For sale by all leading jobbers. Send for circular to

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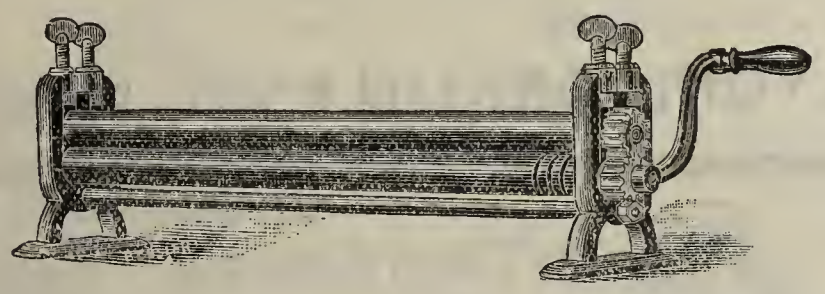


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Tinners' Machinery and Supply Co.,

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Tinners' Tools and Machines, Plumbers' Tools, Cornice Machinery Presses, Dies and Can Makers' Tools.

FULL LINE OF SUPPLIES.

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A Thin Iron Sheet.

An English exchange reports an interesting achievement recently recorded at the Hallam Tin Plate Works, near Swansea, Wales, where an iron sheet of the most remarkable thinness ever rolled is claimed to have been produced. The details show that the iron from which the sheet was rolled was made on the premises, worked in a finery with charcoal and the usual blast, afterward taken to the hammer to be formed into a regular flat bottom, from thence conveyed to the balling furnace, and, when sufficiently heated, taken up to the rolls, lengthened and cut by shears into proper lengths, piled up and transferred to the balling furnace again. When heated it was passed through the rolls, back again into the balling furnace, and when duly brought to the proper pitch taken to the rolls and made into a thorough good bar. On being taken now to the tin mills and rolled until it became thinner than 23 grains, and afterward passed through the cold rolls to give it the necessary polish, it stands on record, says the narrator, as the thinnest sheet of iron ever rolled—that is, the data show a sheet of 10 x 5⅛ inches, or 55 inches surface, and weight but 20 grains; which being brought to the standard of 8 x 5⅛ inches, or 44 surface inches, is but 16 grains, or 30 per cent. less than any previous, and requiring at least 1800 to make 1 inch in thickness.

—A YOUNG MAN MARKED FOR PROMOTION.—A well-known railroad man told this story a few nights ago in the Windsor Hotel: "On my way over from Cincinnati to Columbus last week on one of the 'Big Four' trains, I witnessed a pleasing incident in one of the day coaches. It was bitterly cold outside and all the cars were uncomfortably warm, being overheated with steam. All the passengers had relapsed into the drowsy condition that naturally overtakes one who comes from the cold into an overheated room. In one of the seats in the day coach in which I was sitting there was a genuine old Buckeye farmer woman. She was probably 60 years old. I have never seen a more picturesque Buckeye woman than she. She wore a home made Shaker bonnet and a shawl that was almost antique. On her nose rested a pair of very large German silver bowed spectacles. As the temperature rose the old lady became drowsy and her head nodded frequently. In spite of her efforts to remain awake she was continually napping. Suddenly she would awake and ask at every station: 'Is this Columbus?' She spoke in a shrill voice and addressed the question to no one in particular. On being assured that the station was not Columbus she would at once relapse into a sound slumber again.

"While the old lady was in one of her drowsy spells the conductor, a young man who felt his importance, was passing through the coach. As he entered the car the newsboy came in from the opposite door, and cried out shrilly: 'N' apples, 'n' bananas, 'n' oranges.' As he shouted bananas he was just behind the old Buckeye lady, who started up, and addressing the important young conductor, who was standing in front of her, grabbed him by the arm, and jerking his sleeve said: 'Look here, bub, how do you sell your bananas?'

"An angry blush spread over the young conductor's face as he replied: 'Excuse me, madam, I am the conductor of this train.' The old lady looked at him doubtfully, and the passengers enjoyed his discomfiture; but the young man controlled his temper, and I have marked him for promotion."—*New York Tribune.*

THE METAL WORKER

PATTERN BOOK.

SEVENTH EDITION.

This is a handsome volume of 242 pages, printed on heavy paper, and substantially bound in cloth. It is illustrated by upward of 520 line engravings.

The work is comprised in five general divisions or chapters, bearing the following titles: (1) Definitions and Technicalities; (2) Drawing Tools and Materials; (3) Geometrical Problems; (4) The Art and Science of Pattern Cutting; and (5) Pattern Problems. These titles sufficiently indicate the subject matter of the several parts.

The List of Problems

demonstrated is very extensive, and embraces almost everything of common occurrence in the sheet-metal trades, with enough of the exceptional to show methods adapted to special requirements. This chapter, in short, is a ready reference book for all who have pattern cutting to do. Each demonstration is complete in itself. A carefully prepared index facilitates reference. The work has been prepared for sheet-metal workers in general, and not for any one class in particular. The tinner will find in it what he requires, without the necessity of studying the cornice problems. The cornice maker will find in it everything from a simple miter to the most complex problems, so arranged as to meet his requirements, without the necessity of going through portions in which he is not interested. The general student will find the entire subject presented in such a manner as will facilitate systematic study. The rapidity with which each edition has been exhausted, and the universally favorable comments it has called forth, prove that it fully meets the want it was intended to supply.

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Above cut represents Brombacher's new gutter beader. This gutter beader is the strongest, quickest operating and best constructed gutter beader in the market. Furnished in any desired length. Please send for circular and price.

The "Lyon" Shear.



One-third Exact Size. No. 80.

(PATENT APPLIED FOR.)

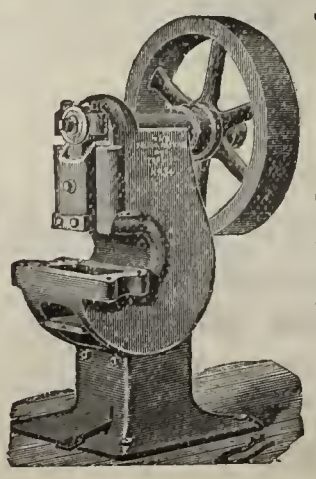
This shear is especially adapted to **Cornice and Tin Work,** being so constructed that **Scrolls, Circles,** &c., can be **perfectly** and **accurately** cut, which **cannot** be done with the ordinary shear. They are made **of the best** material, the **steel extending beyond** the **bolt,** thus allowing the bolt to **pass through steel,** which prevents the shear from becoming loose.

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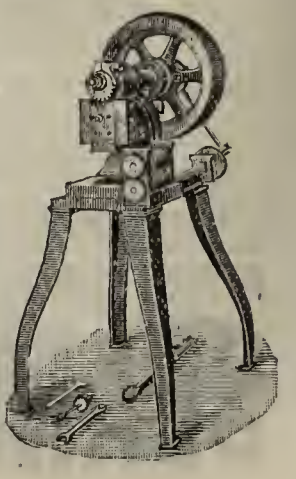
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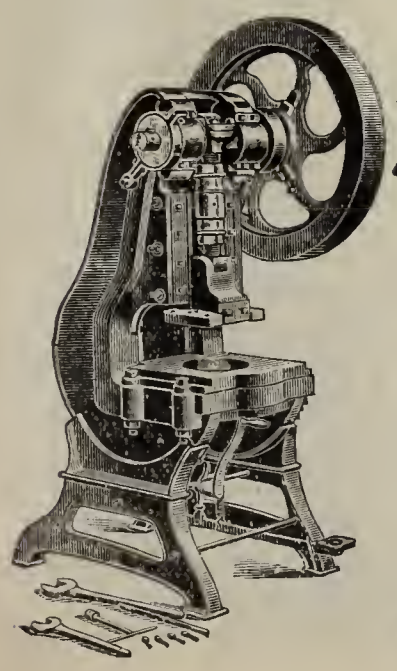
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Bowers, Galpin & Co, Binghamton, N. Y.
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Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Columbia Corrugating Mfg. Co., Niles, O
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Globe Iron Roofing & Corrugating Co., Cincinnati, O.
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Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
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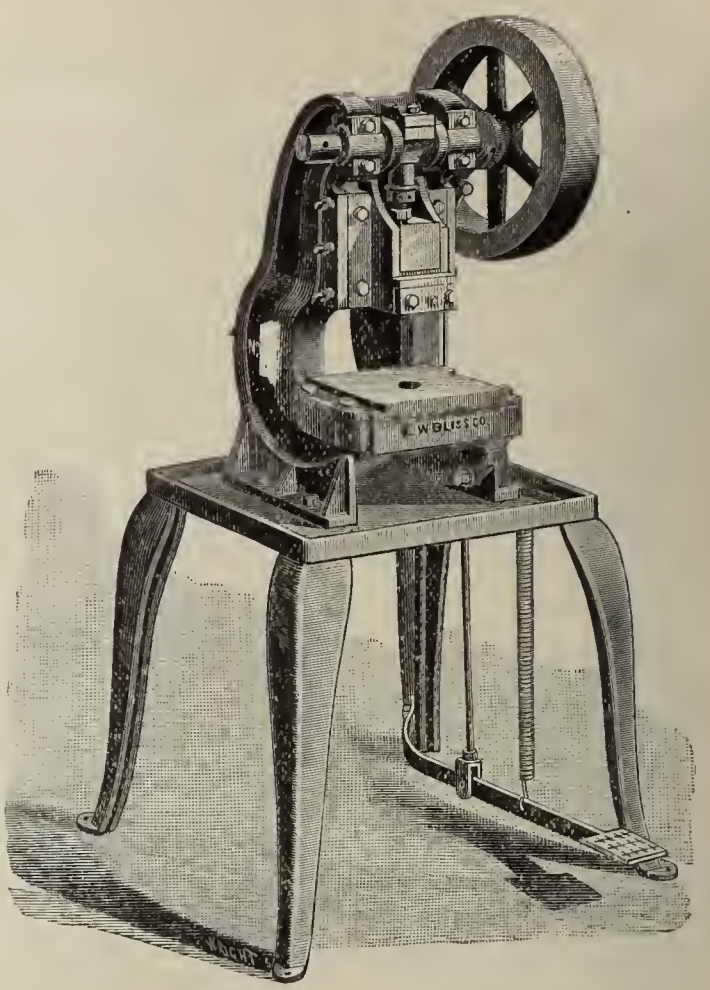
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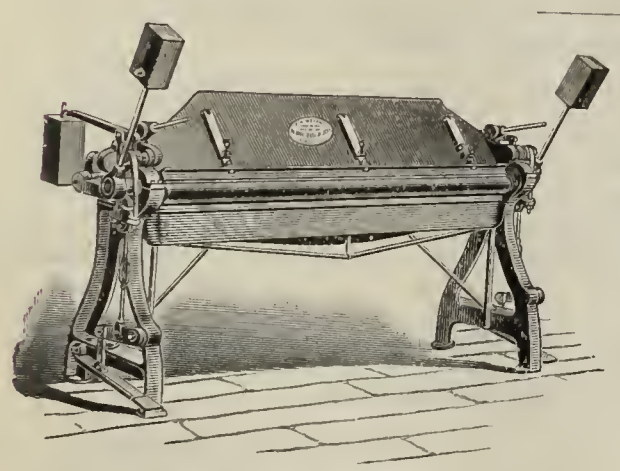
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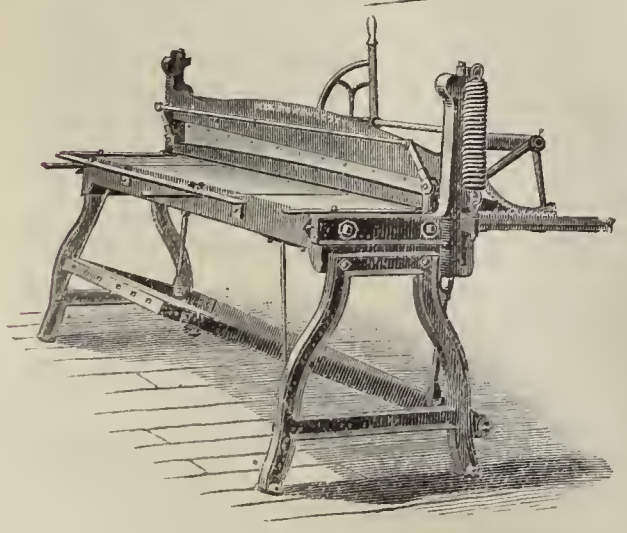
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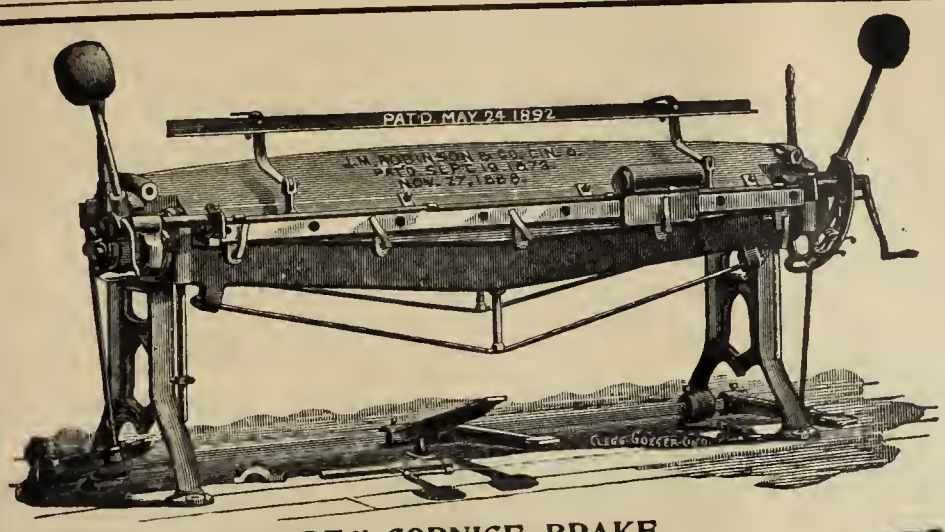
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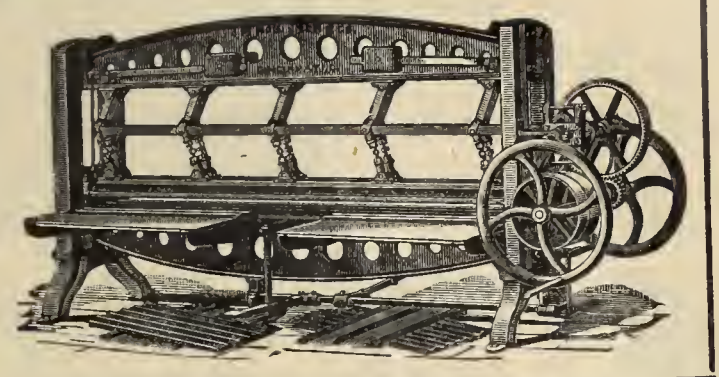


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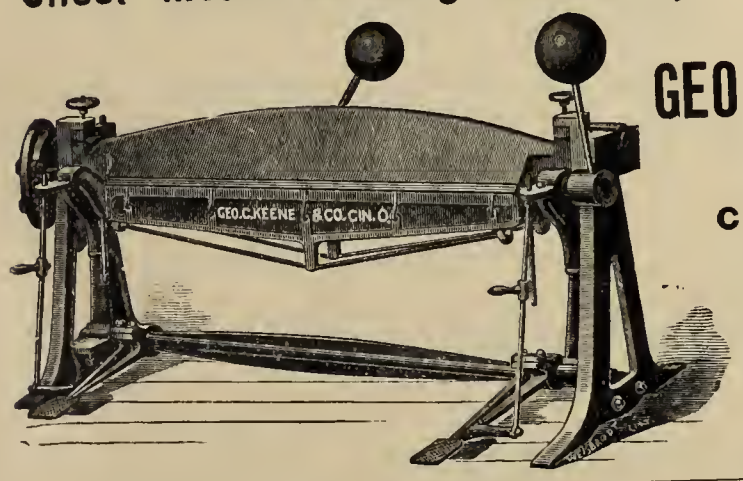
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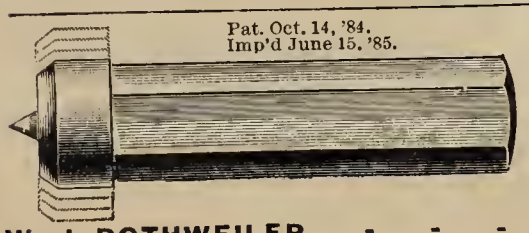
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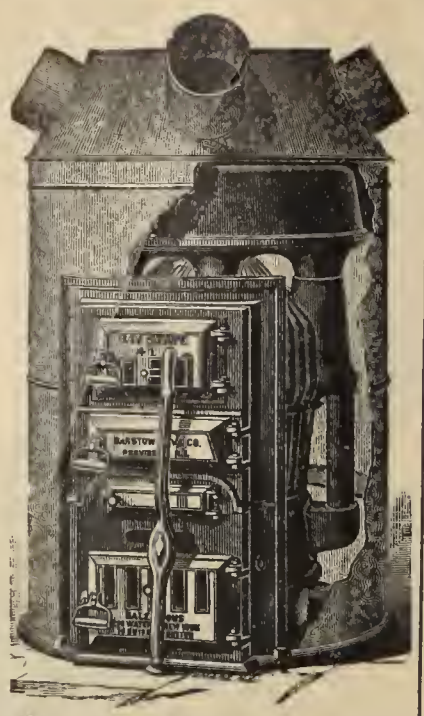
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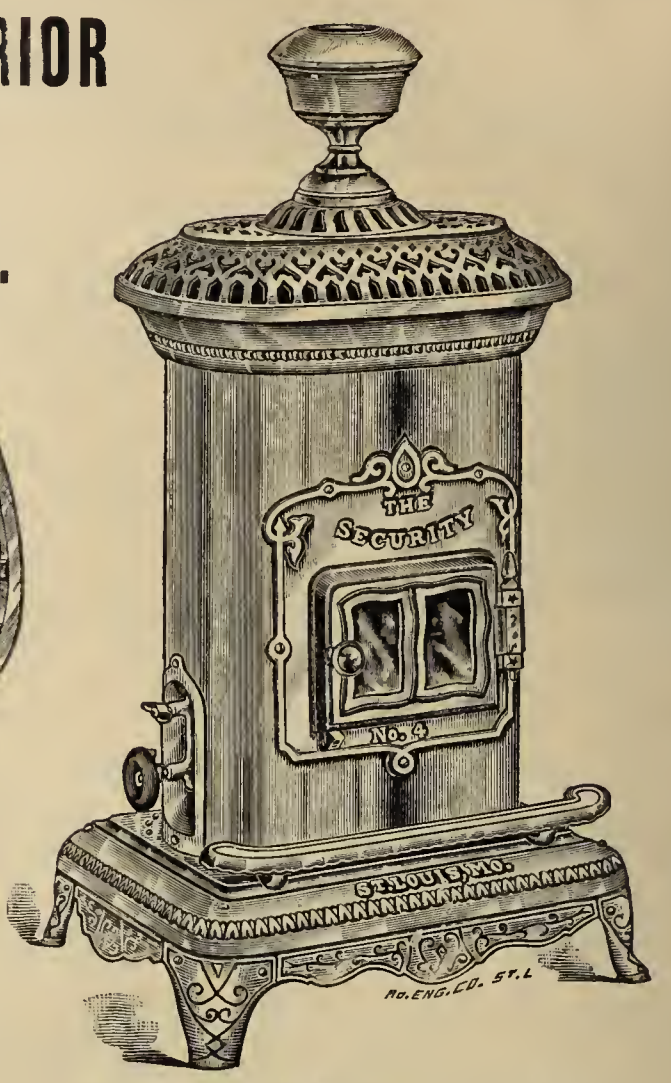
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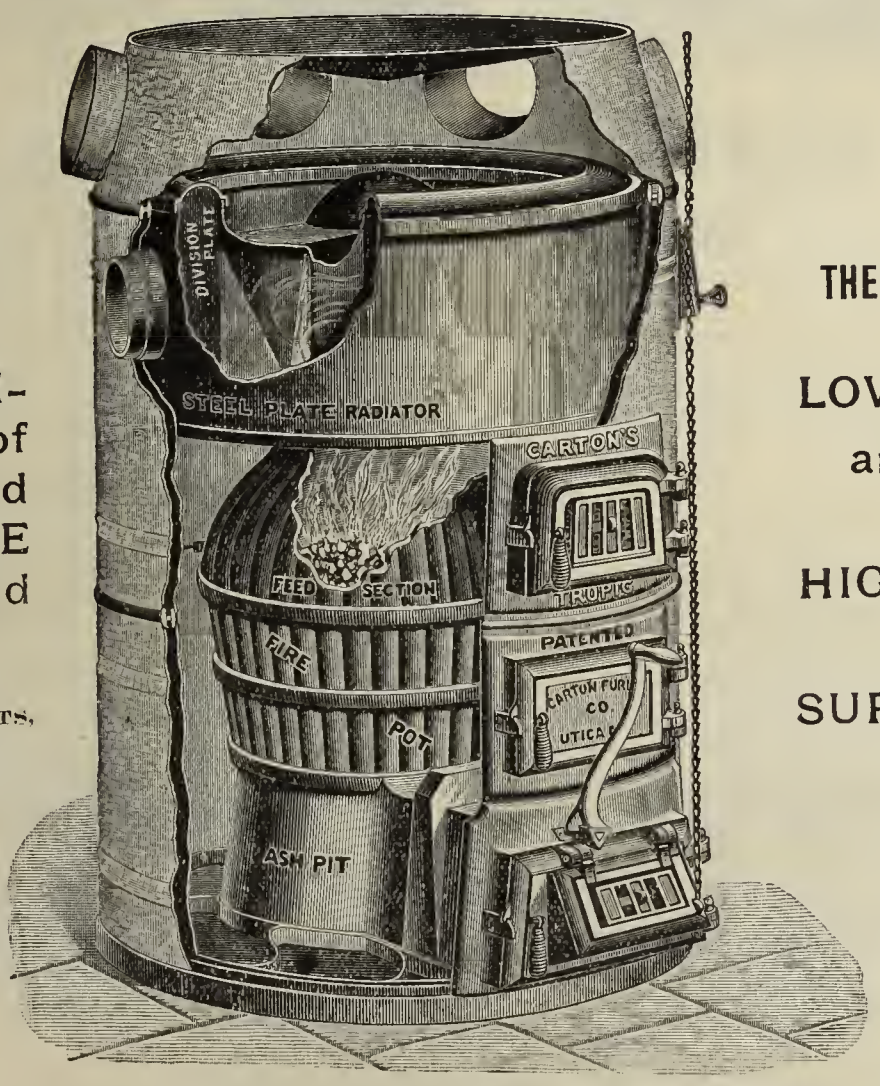
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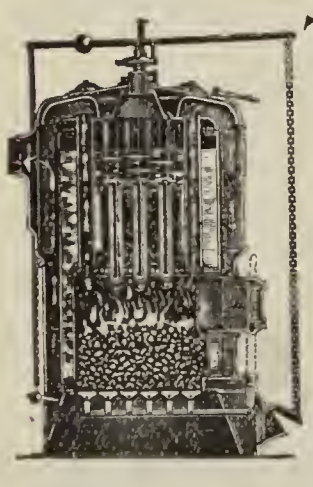
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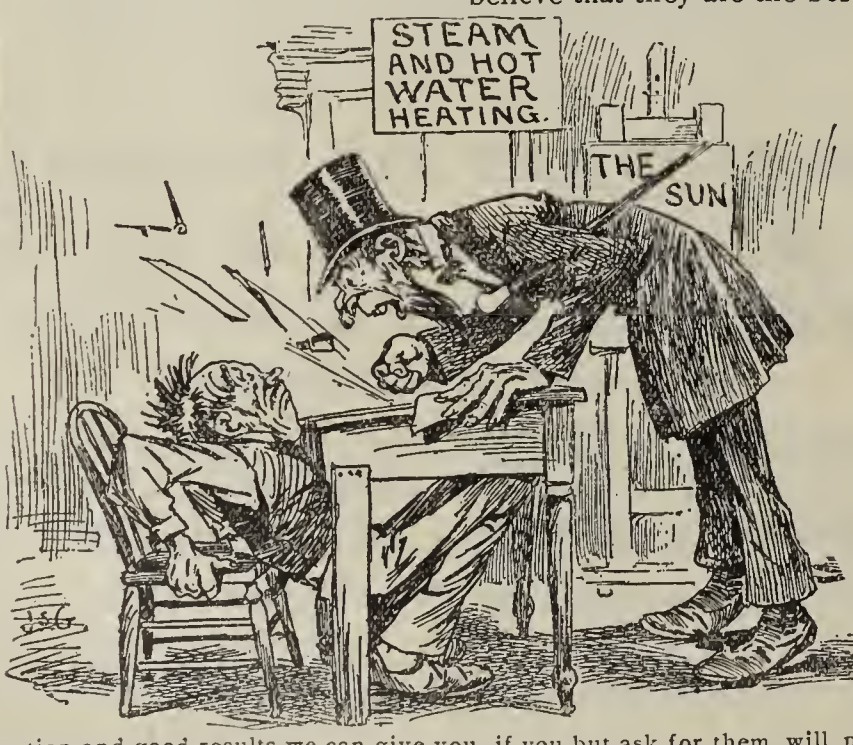
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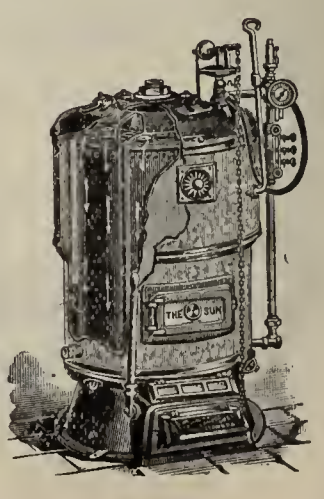
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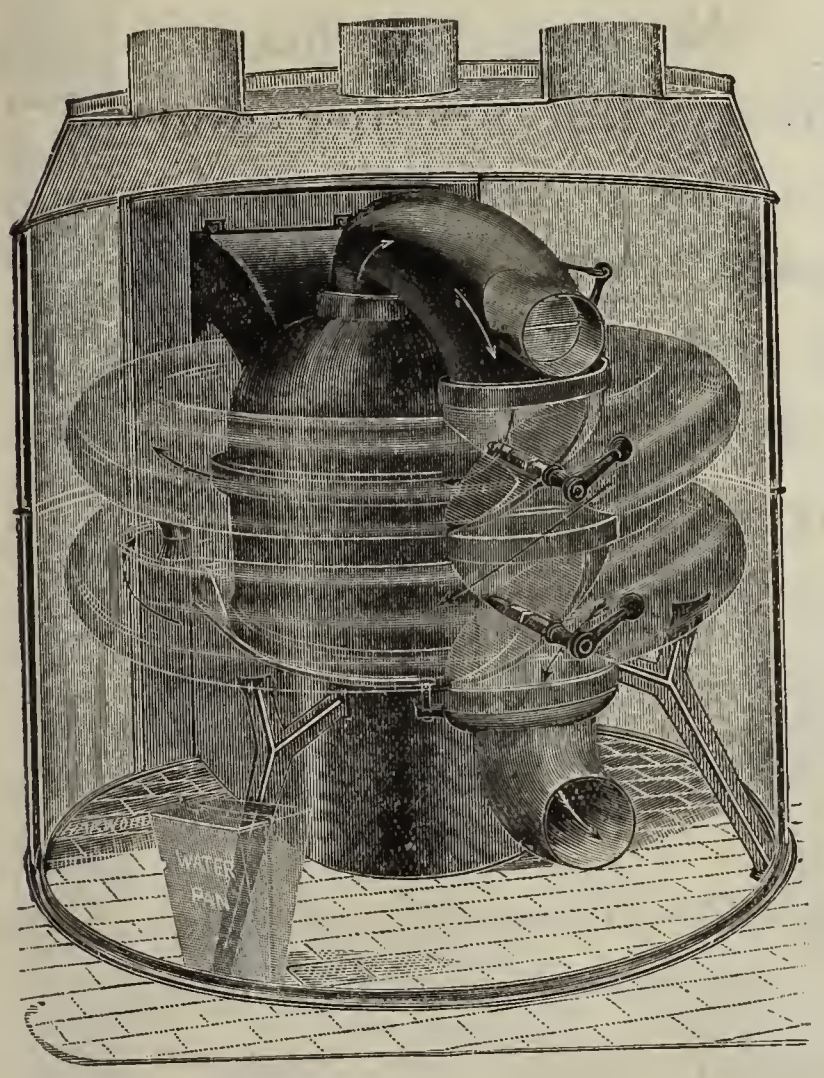


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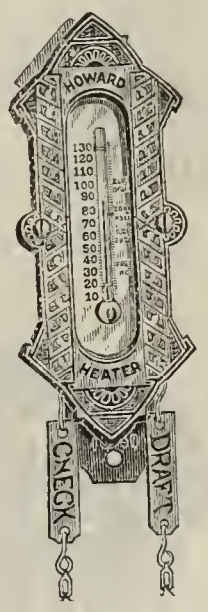
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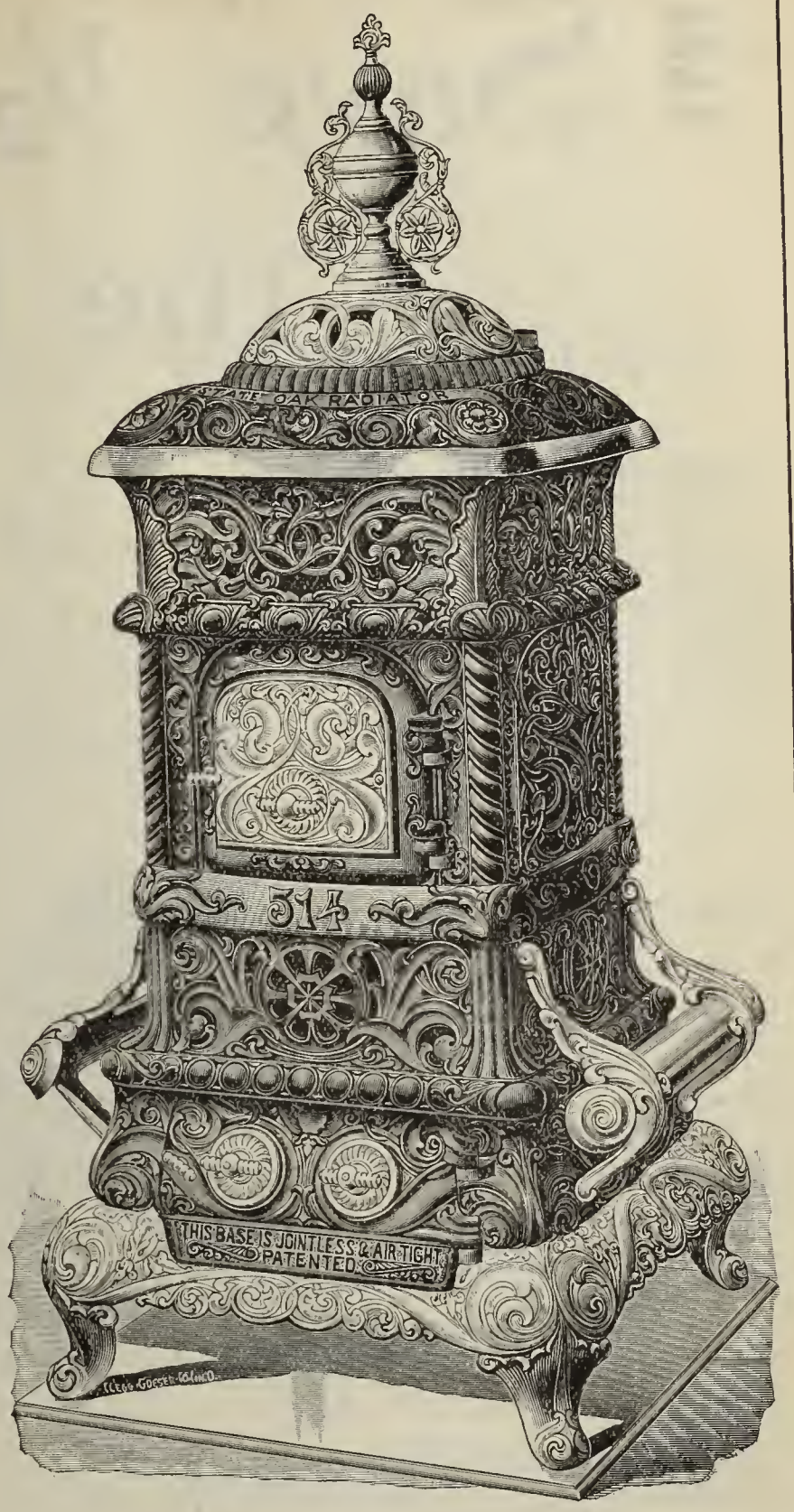
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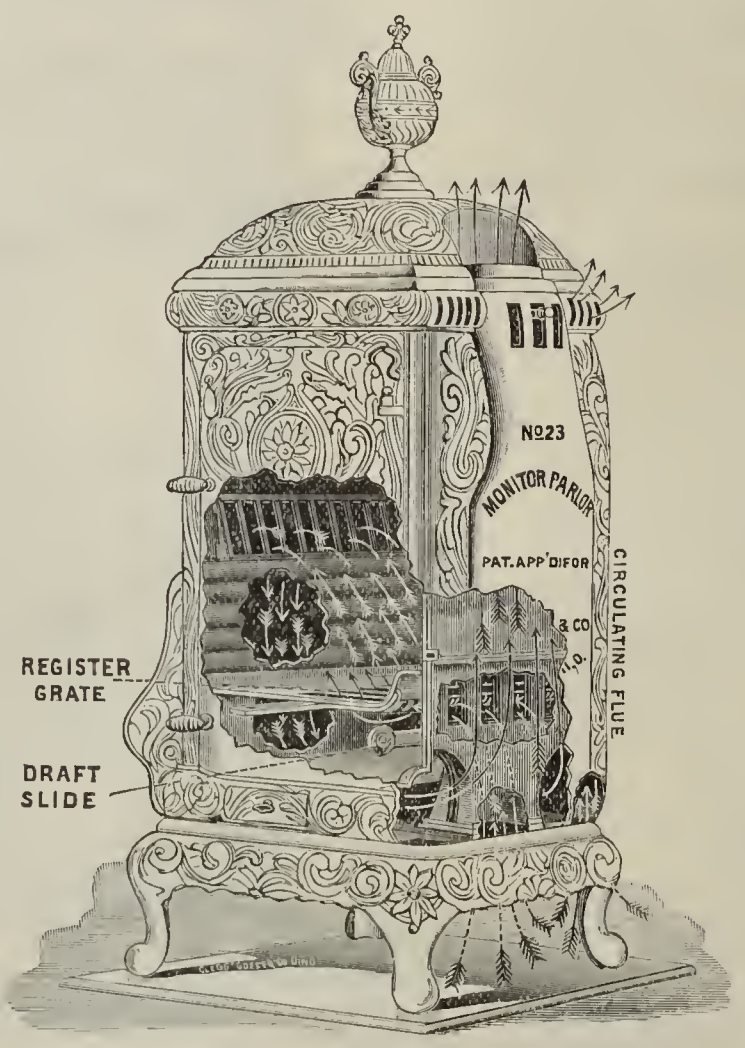
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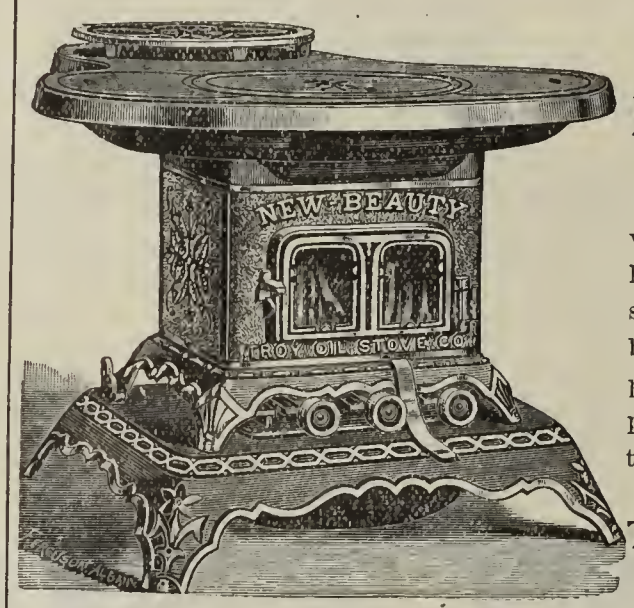


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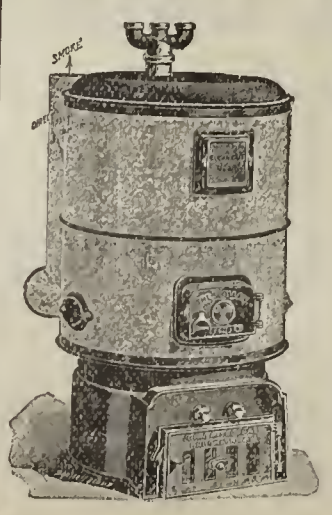


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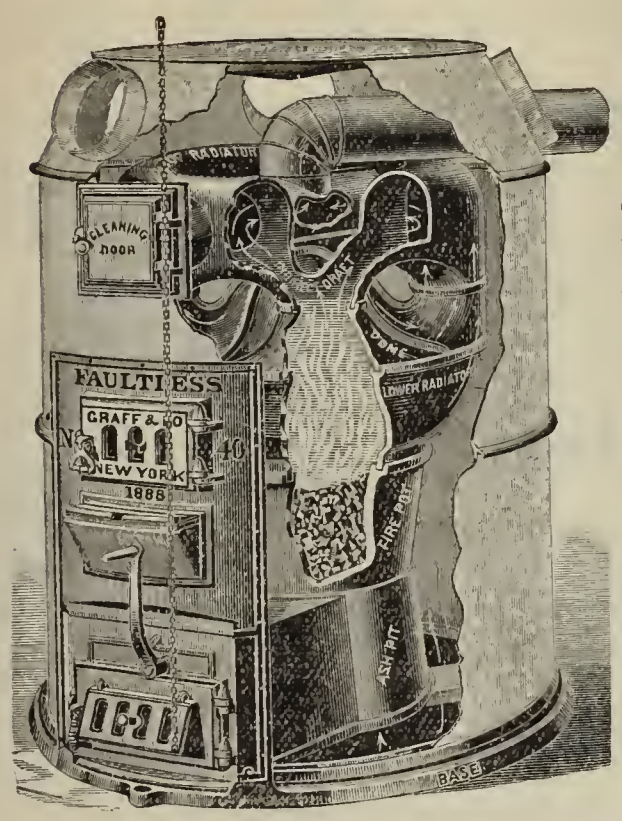
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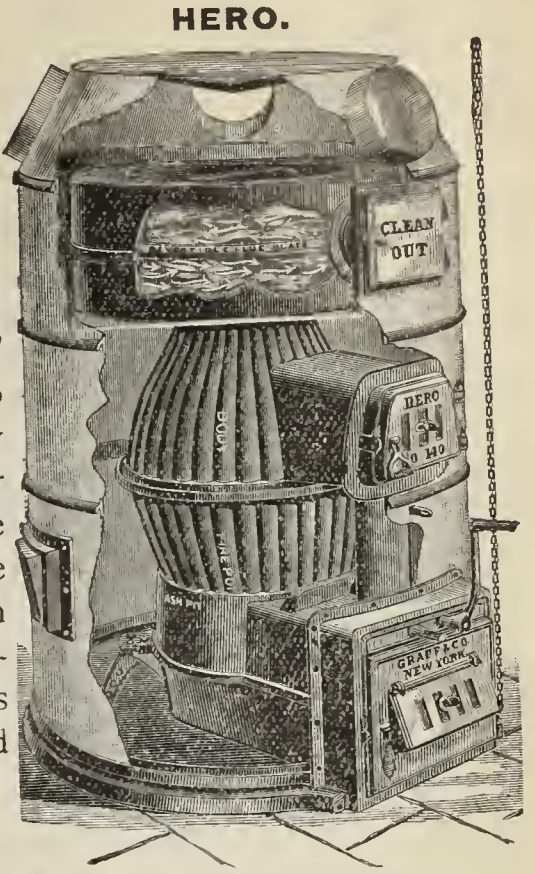
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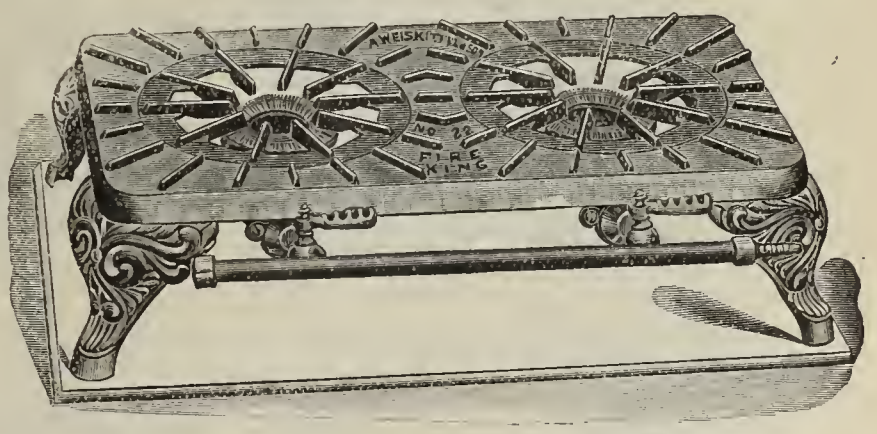
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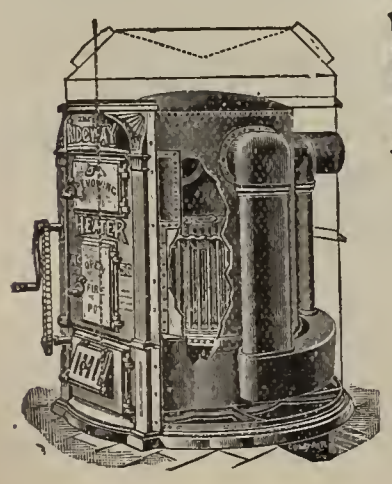
The accompanying cut shows the style of one of the five lines we manufacture



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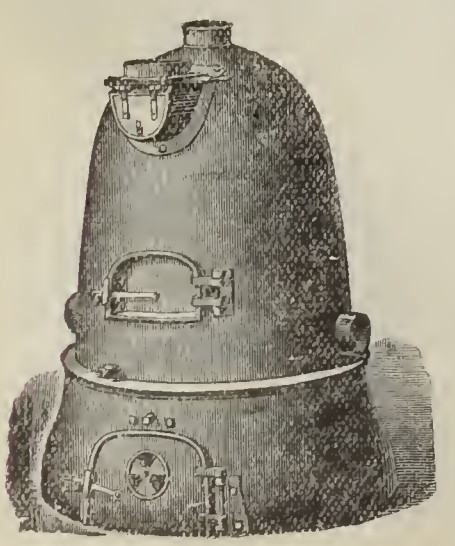
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Why Is It?



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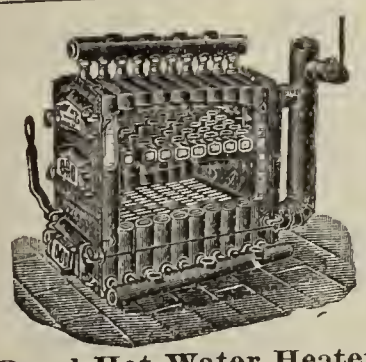
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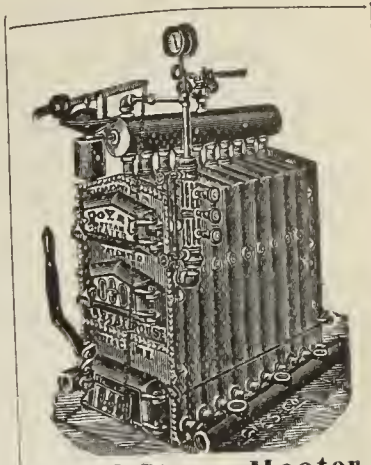
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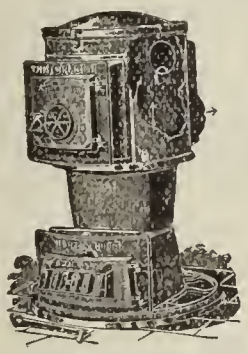
Sold on their Merits, and not on their Antiquity.



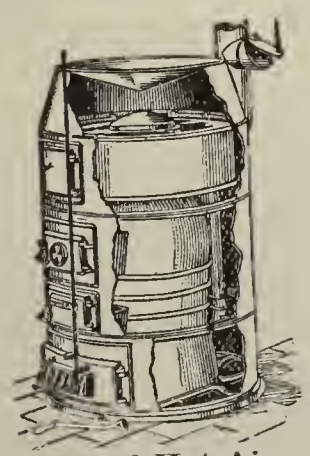
Royal Hot Water Heater.



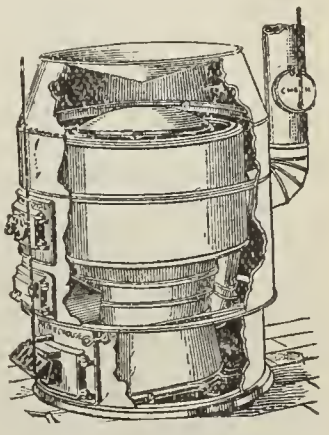
Royal Steam Heater.



Imperial Hot Air Furnace.

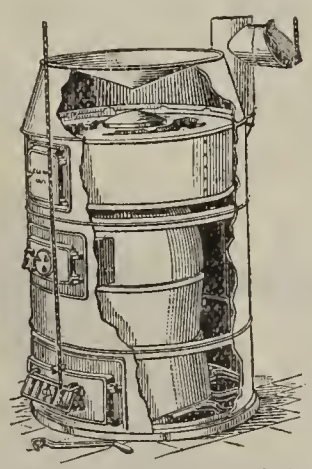


Royal Hot Air Furnace.

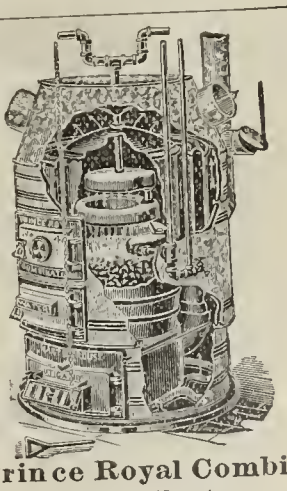


Prince Royal Hot Air Furnace.

ROYAL HEATERS



Royal Victor Hot Air Furnace.



Prince Royal Combination Heater.

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CHICAGO, 79 LAKE STREET.

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—BY—

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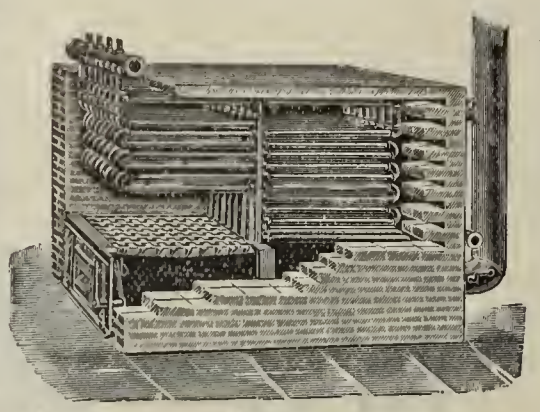
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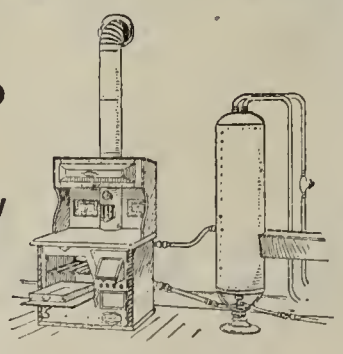


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Hot Water Heaters, Steam Boilers AND Radiators.

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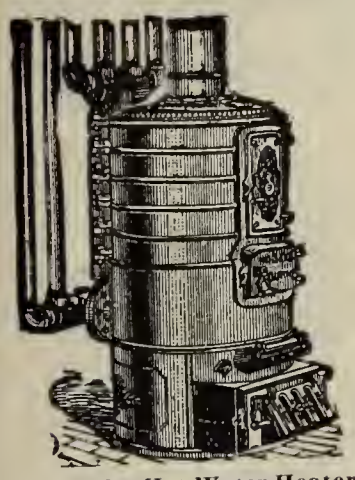
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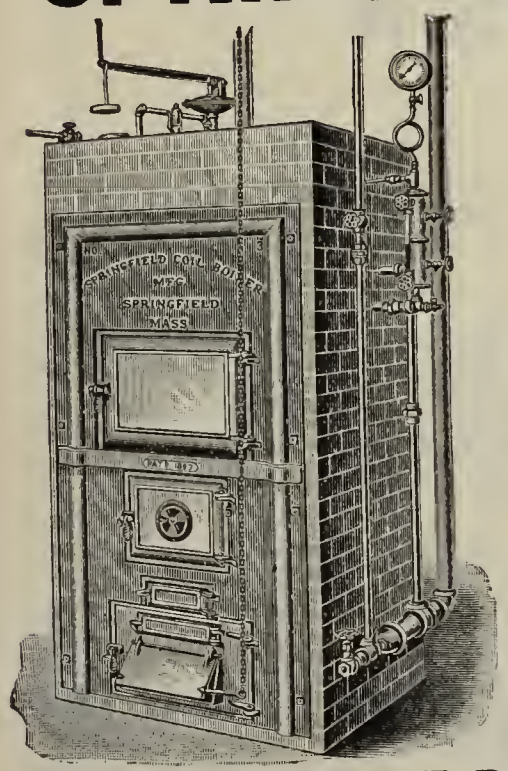
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Gurney Steam Boiler.
Positively maintains steady water line and will not foam.

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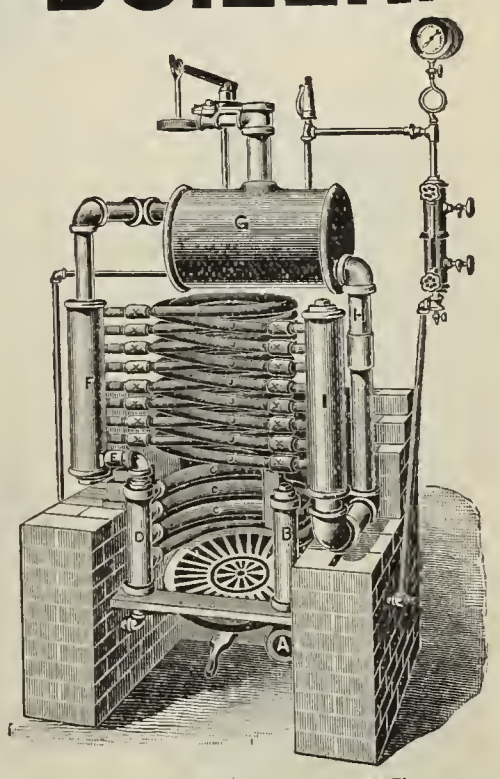


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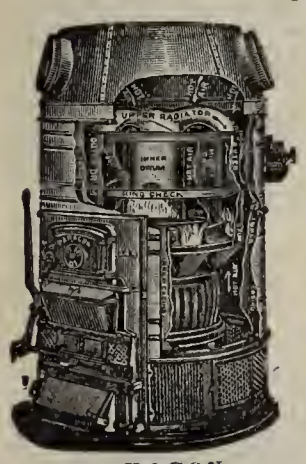
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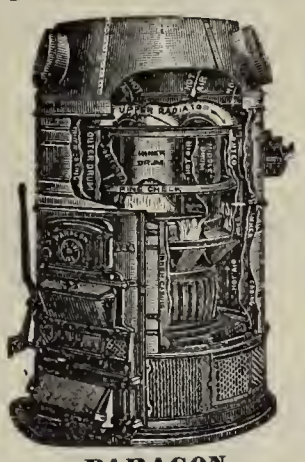
A CONTINUAL PROCESSION OF



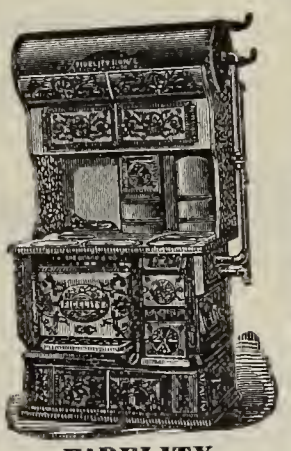
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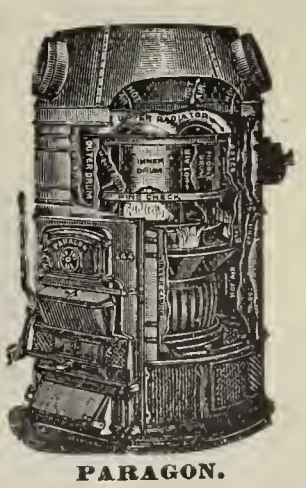
FIDELITY.



PARAGON.



FIDELITY.



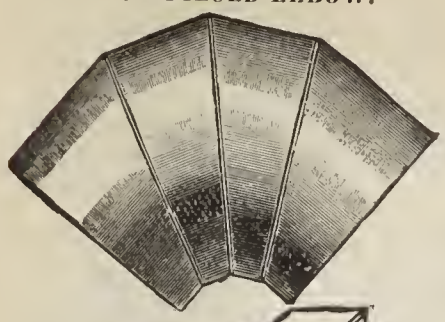
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PARAGON FURNACES and FIDELITY RANGES

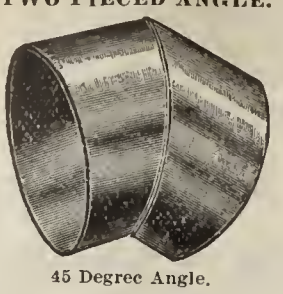
Is moving steadily from our works to the homes of delighted purchasers, by way of the stores of enterprising dealers, who have found profit in aiding the course of the procession. You can get into line if you will.

Isaac A. Sheppard & Co., Manufacturers, 1801 N. Fourth St., Philadelphia, Pa.

FOUR PIECED ELBOW.

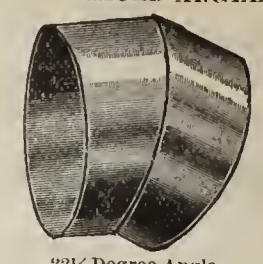


TWO PIECED ANGLE.



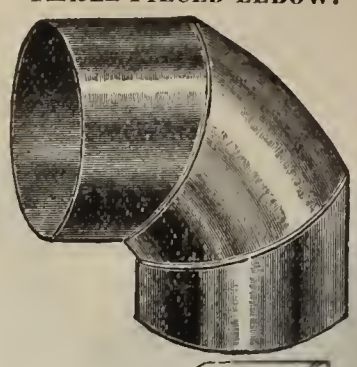
45 Degree Angle.

TWO PIECED ANGLE.

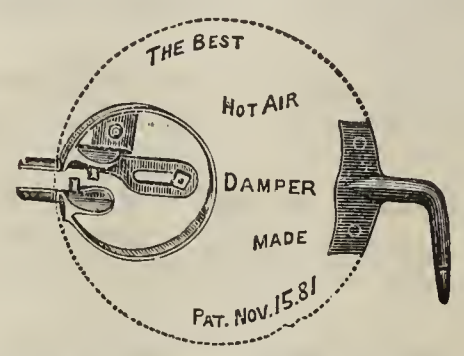


22½ Degree Angle.

THREE PIECED ELBOW.



DAMPERS COMPLETE FOR HOT AIR PIPE.



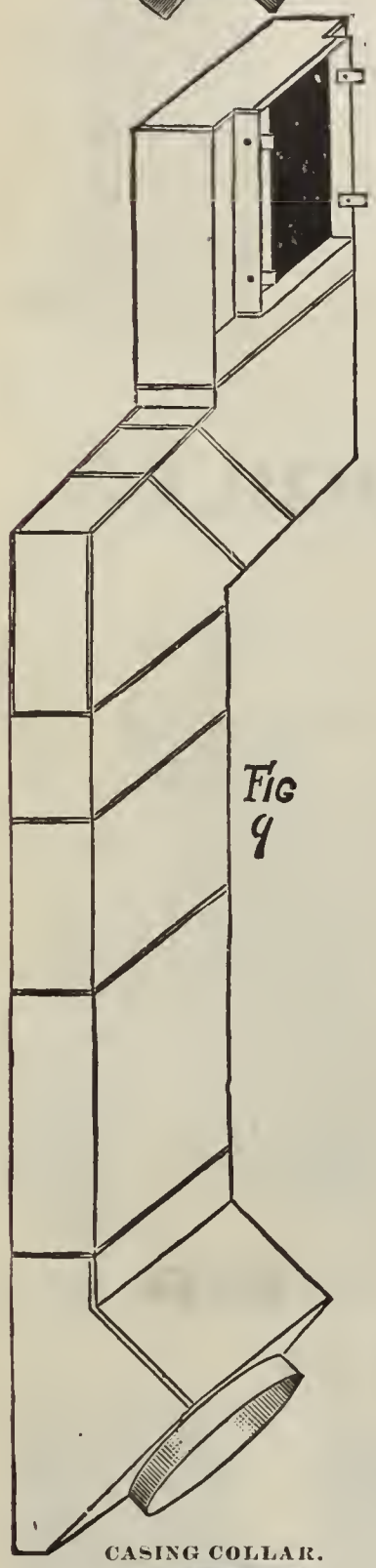


Fig 9

IS NOT THIS A FACT?

That the poorest goods are often represented by the finest cuts?

AND

IS NOT THIS ALSO A FACT?

That you cannot know that we make the most Perfect Pipe and Fittings until you have made comparison?

AT OUR OWN EXPENSE.

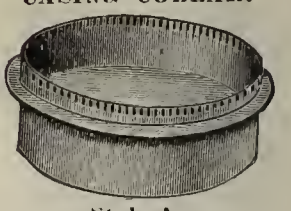
Send a sample order and compare the ***PERFECTION*** pipe with all other, and if upon comparison you do not find it superior to all other, return it at our expense

The Perfection Furnace Pipe Co.,

TOLEDO, O.

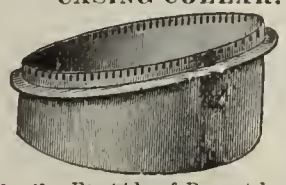


CASING COLLAR.

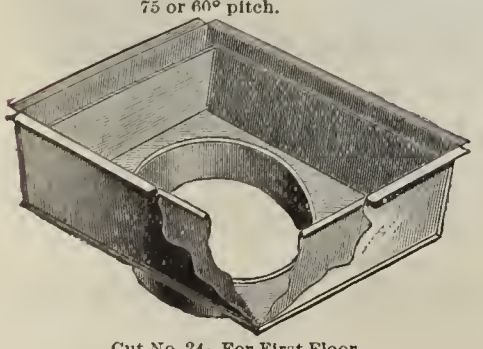


Style A.
For Top of Bonnet.

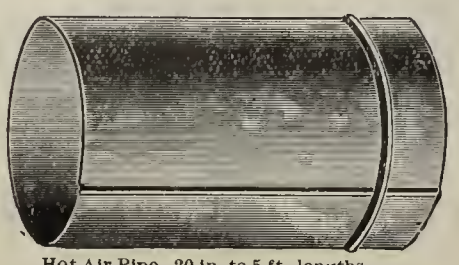
CASING COLLAR.



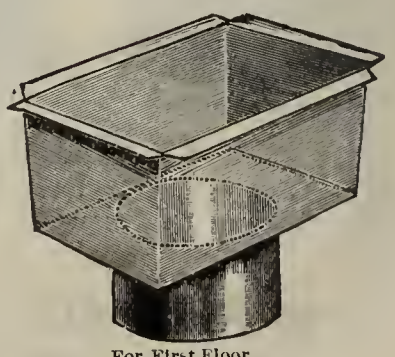
Style B. For Side of Bonnet having 75 or 60° pitch.



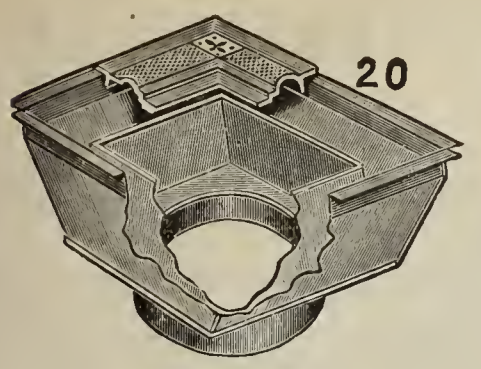
Cut No. 24—For First Floor.

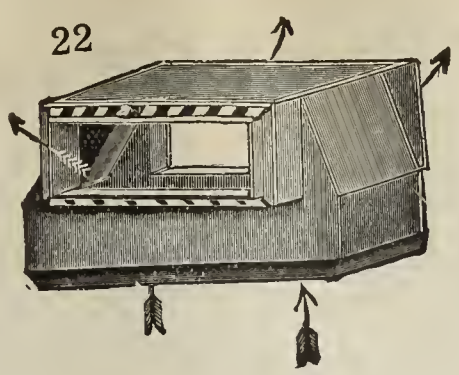


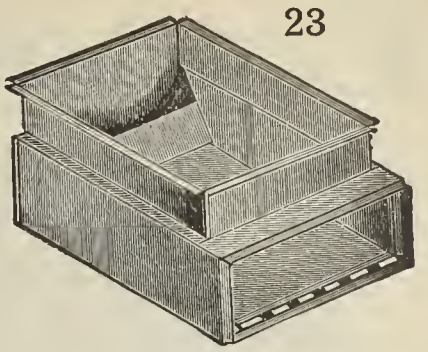
Hot Air Pipe—20 in. to 5 ft. lengths.

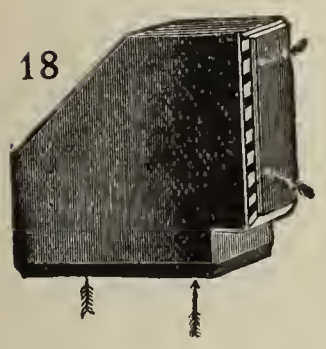


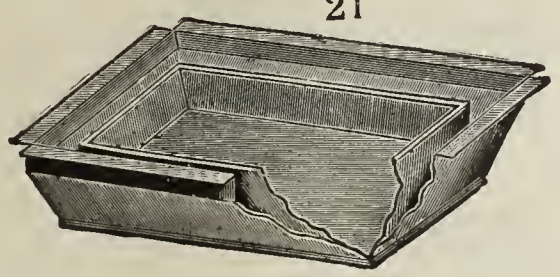
For First Floor.

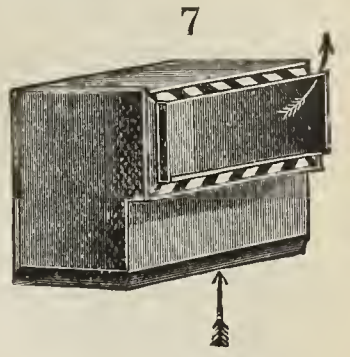

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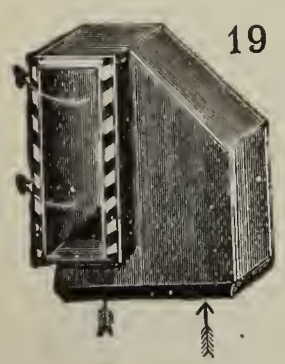

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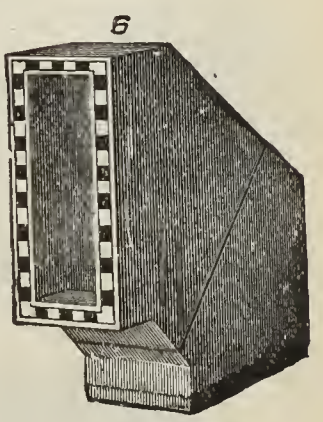

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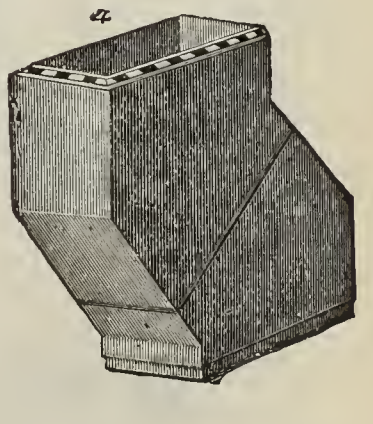

21


7


19

Our aim is not
As to how cheap
But how good we can
Furnish goods and
At a price less than you can
produce them.


6

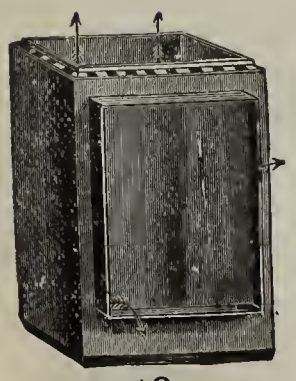

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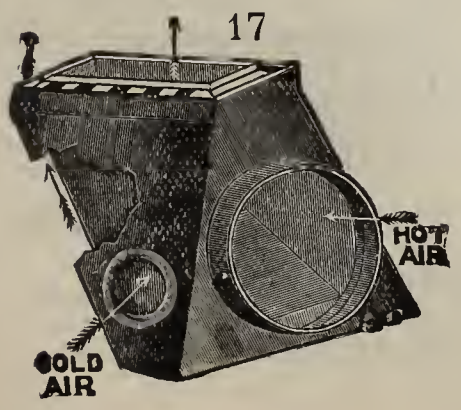
WE SHALL BE PLEASED TO SEND YOU CATALOGUE AND QUOTE YOU PRICES.

The Perfection Furnace Pipe Co.,

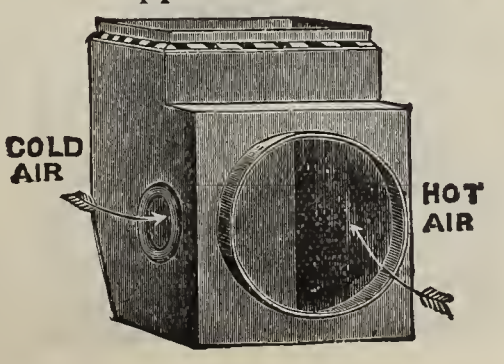
Cor. Broadway and Logan St.,

TOLEDO, O.

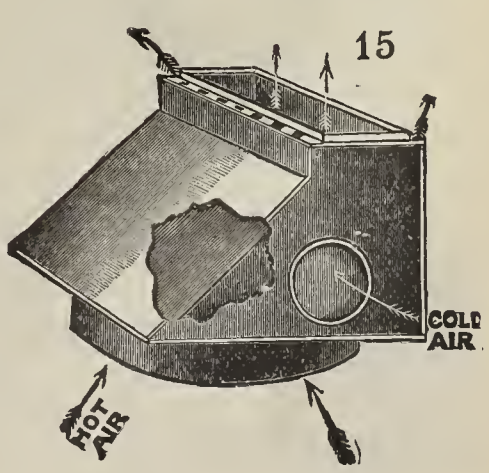

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15

Excelsior Furnace Fittings!

The original and only complete line of these goods made.

Please note prices and compare with those made on any competing line.

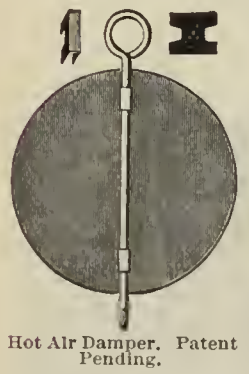
Prices named are f.o.b. Chicago on orders of $10 or more, and freight will be allowed to points between Omaha and Boston on bills paid in ten days.

You can save a dollar on your first order of $10 or over if you have never used these goods by sending coupon.

List is on I C; add 20 per cent. for I X.

Sizes	7 in	8 in	9 in	10 in	12 in	14 in	16 in	18 in	20 in	24 in	30 in
Hot Air Pipe, per foot	10	11	12	13	17	25	30	35	45	65	1.00
" " Elbows, three-piece, each	16	18	20	22	30	50	60	70	90	1.30	2.00
" " " four-piece, each	18	20	22	25	35	55	65	75	1.00	1.40	2.10
" " Angles, 45 degrees	10	11	12	13	20	30	35	40	50	80	1.05
" " " 22½ "	10	11	12	13	20	30	35	40	50	80	1.05
" " Dampers	7	8	9	10	12	15	20	25	30	40	50
Casing Collars for top of Bonnet	7	8	9	10	12	15	20	25	30	40	55
Casing Collars for side of straight Bonnet	14	16	18	20	24	30	40	50	60	80	1.10
Casing Collars for side of 75 or 60 degree Bonnet	17	20	23	25	30	37	50	63	90	1.05	1.50
Galvanized Iron Pipe, per foot	12	14	18	22	30	35	40	45	50	60	....
Galvanized Iron Elbows, each	24	28	36	44	60	70	80	90	1.00	1.20	2.00
" " Angles, 45 degrees	20	24	32	40	40	50	60	70	80	1.00	1.75
" " " 22½ "	20	24	32	40	40	50	60	70	80	1.00	1.75
Smoke Pipe Dampers	15	18	25	...	....	...	....	....	....	....	. .
Safety Thimbles	40	42	44	46	55	..	...	....	....	....	....
Plaster Collars	14	16	18	20	25	30	35	40	50	60	90
Finishing Collars	28	32	36	40	50	60	70	80	1.00	1.20	1.80
Inside 1st floor Box Collars	7	8	9	10	12	15	20	25	30	40	60
Outside " "	5	6	7	8	10	13	18	23	28	38	58
Stack Collars	7	8	9	10	12	15	20	25	30	35	50
Boot Collars	5	6	7	8	10	13	16	20	25	35	50

NOTE.—Hot Air Pipe Elbows and Angles 14 inches in diameter and above are made of I X tin, up to and including 20 inches, 24 inches and 30 inch goods of I X X tin.



Hot Air Damper. Patent Pending.

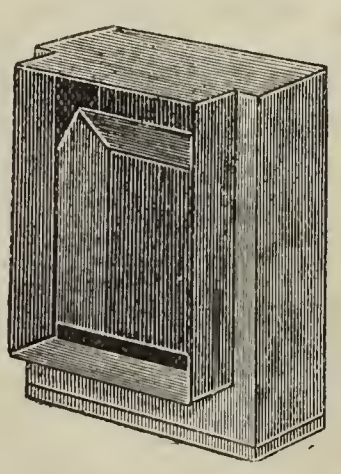
Metal Worker Coupon No. 5
Value $1.00 on order of $10.00 on conditions named.
Excelsior Steel Furnace Co.
DUPLICATES VOID.

FULL CATALOGUE ON APPLICATION TO

The Excelsior Steel Furnace Co.,

38 W. Monroe St., Chicago.

THE MAHONY BOILER'S FOR STEAM AND HOT WATER HEATING



Novelty Ventilated Wall Pipe,

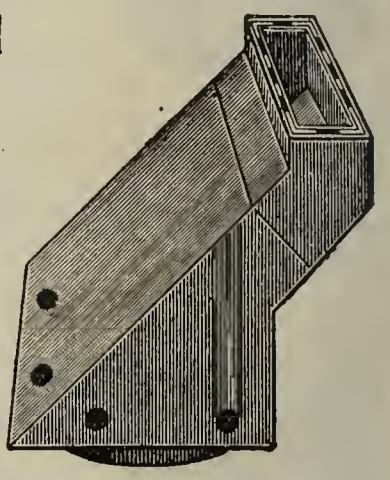
Absolutely Fire Proof.

The "Novelty Ventilated Wall Pipe" is manufactured of best bright tin, by machinery made specially for the purpose, and is made in lengths from 1 inch to 8 feet, the joints all being double seamed; and is constructed in such a manner that any mechanic can, if it becomes necessary to shorten pipe, remove socket end, cut pipe off and replace socket in a few moments.

MANUFACTURED BY

JOHN P. SCHAFFER.

18 Wood Street, Pittsburgh. Pa.



BAKE-WELL STOVES AND RANGES
WESTERN STOVE MFG. CO. ST. LOUIS MO.

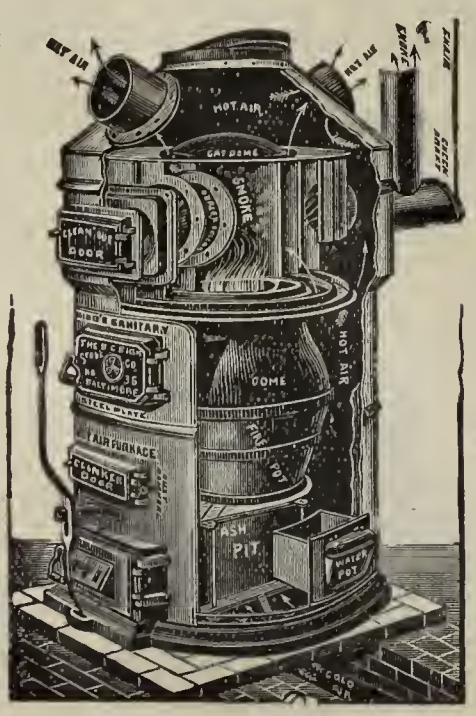


Established 1827.

W. Jackson's Sons.

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons Andirons, Tiles, &c.

Office and Showrooms, 246 Front Street, within three minutes of Fulton Ferry Factory, 268 Water Street New York.



THE B. C. BIBB STOVE CO.
BALTIMORE, MD.,
Manufacturers of

THE BIBB SANITARY HOT AIR FURNACE.

Portable, 5 Sizes; Brick Set, 2 Sizes.

The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

BIBB'S ORIGINAL

Baltimore Fire Place Heaters,

And a Full Line of

COOK STOVES, RANGES, HEATING STOVES, HOLLOW-WARE, &c.

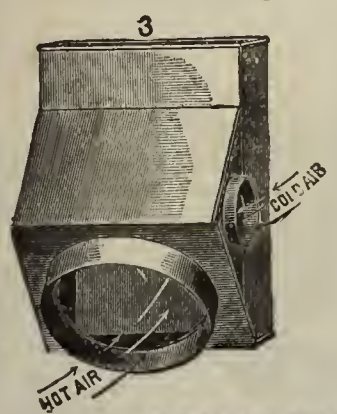
Send for Catalogue with Testimonials.

Why can't we make a deal with you on Furnace Pipe?

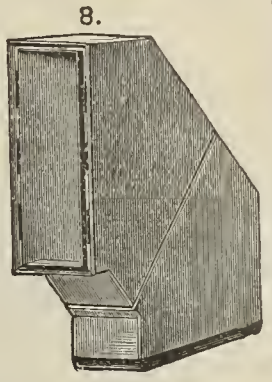
We have the *goods, prices and inclination* to win your trade, and if you'll give us the opportunity will send catalogue descriptive of the first, discounts to prove the second, prompt attention and prompt shipments to verify the third.

You can't help liking our goods, because every furnace dealer who uses them once continues doing so. They can be set in one-quarter of the time required in placing ordinary hand made pipes. Any shape or style of stack can be constructed without using the snips. Every length is double and fitted with slip and socket joint, and is manufactured of the best bright full weight plates. Let us reason with you on the matter, and mail you catalogue, discounts, &c.

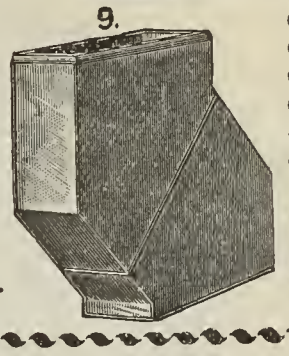
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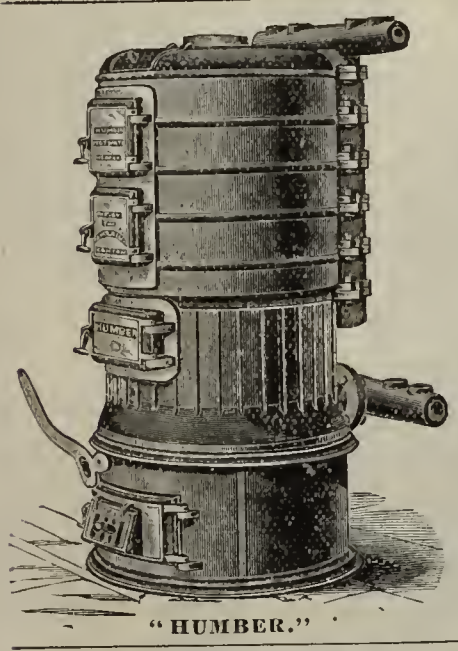
8.



9.



SAFETY FURNACE PIPE CO.,
Nos. 11 & 13 Atwater St., E., - DETROIT, MICH.
Eastern Agents, Riter Bros. & Co., Philadelphia, Pa.



"HUMBER."

"Canton Heaters"

FOR

Hot Water, Steam AND Hot Air,

Humber, Hartford, Yale, Sandow.

Cambridge, Tubular.

Oxford Perfect Blast.

Plenty of Sizes. For all Kinds of Fuel. A good line to handle.

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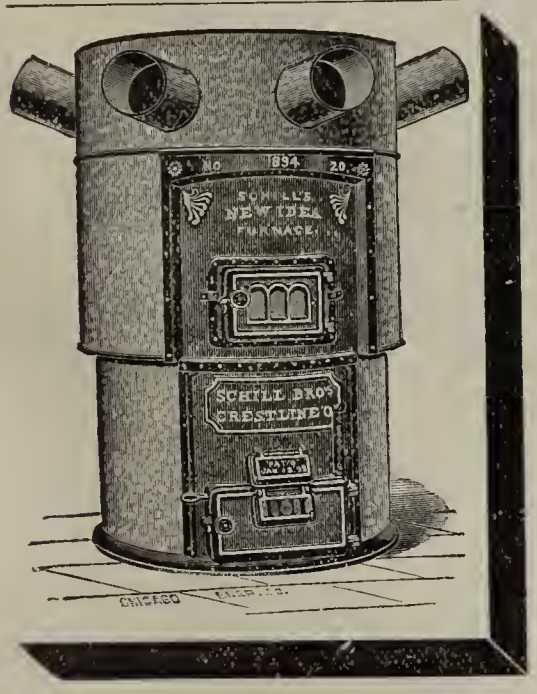
THE J. H. McLAIN CO.,

Canton, OHIO.
88 Lake St. CHICAGO.

BOSTON, 191 Ft. Hill Sq.

NEW YORK,

SAN FRANCISCO, No. 4 Crocker Building



What are You

looking for in the way of a heater? If you want something that saves fuel (not on paper), something that will give you all the comforts of home in the severest weather, then buy

Schill's Idea

and you'll never regret it Get our pamphlet on heating, what others say and think about it. . . . . .

SCHILL BROS., Crestline, O.

Davis, Johnson & Co., Chicago.

Union Iron Wks. Mfg. Co., Denver, Col.

A Foreign Communication.

Strange and incomprehensible, says an Australian paper, are the ways of the foreign correspondent! In a recent issue the *Mercantile Guardian* prints the following letter from a European manufacturer:

"Mrs. —— and Cie, Lim., London, E.C.

"Gentlemen!—Thanking your honnourable adress for a friend acquainted with your esteemed firm, I beg leave to send you some samples of garters for the Pennysell, with the polite beg to prove them besides the understanding moderate prices, and convenient to you, you will impart to me your kind orders.

"Assuring you beforehand to the best dispatch, I remark yet, that I am willingly ready, if you are wishing of better species of samples, to send you such.—With most

"respectable honour (Signed), ——

"Prices net, free warehouse and packing."

According to a local journal, Herbert Page, an assistant in the physical laboratory in the Central High School of Kansas City, Mo., has completed an electric motor which is probably the smallest in the world. It weighs but $\frac{1}{3}$ ounce. It is of the drum armature type, and is complete in all of its parts. The armature is but $\frac{3}{16}$ in diameter, and the motor is only $\frac{1}{2}$ inch high The machine runs at the velocity of 5000 revolutions a minute. It requires a current of $\frac{1}{4}$ ampere, with a pressure of 3 volts. The motor would make an appropriate watch charm.

100 %

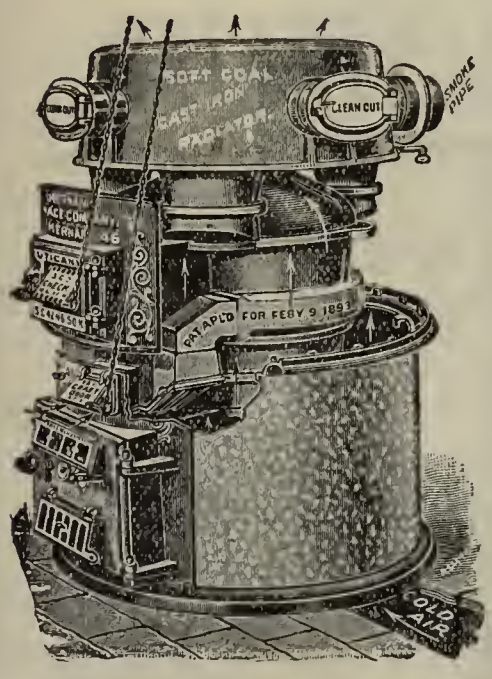


More heat, less trouble, greater satisfaction and more economical than any other. **WE PROVE THIS.** Don't buy till you've heard from us.

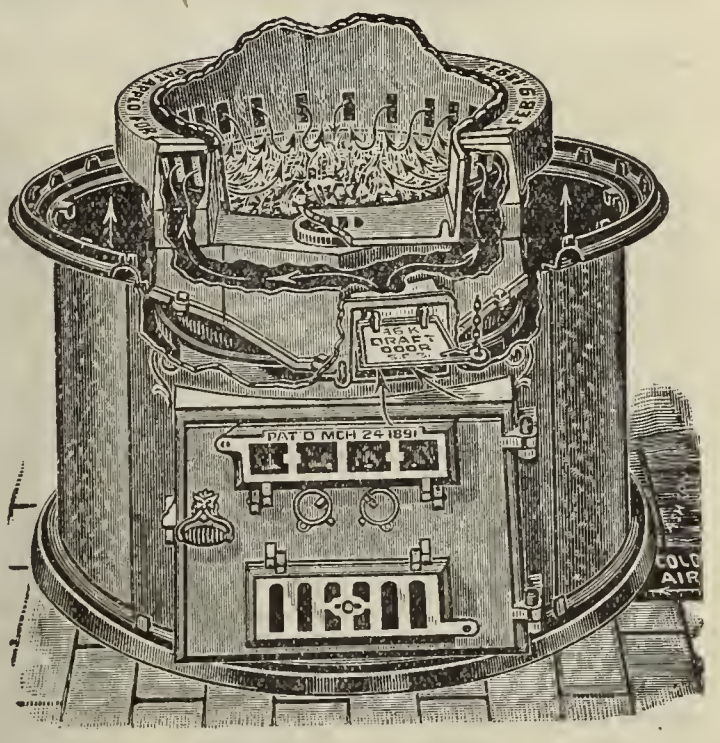
THE CRAIG-REYNOLDS FOUNDRY CO., - Dayton, O.

KERNAN

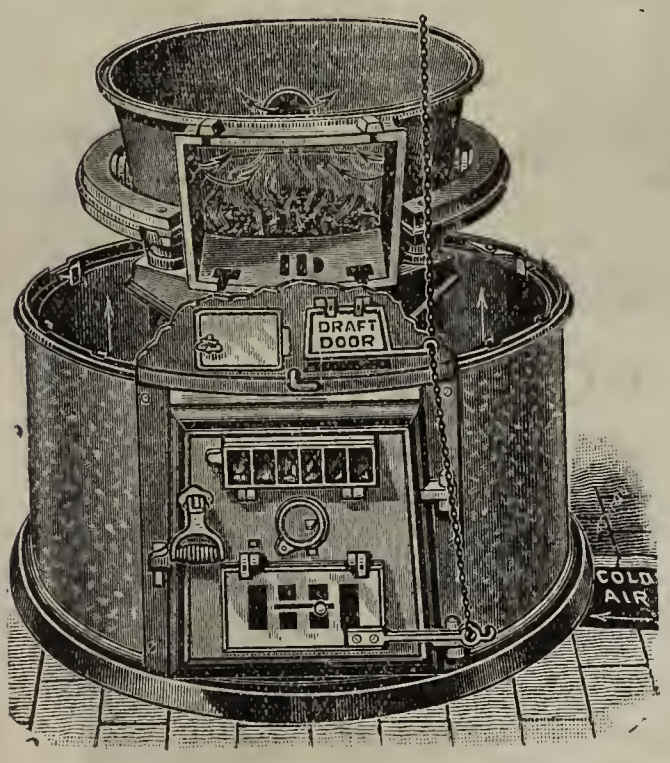
Soft Coal Furnaces.



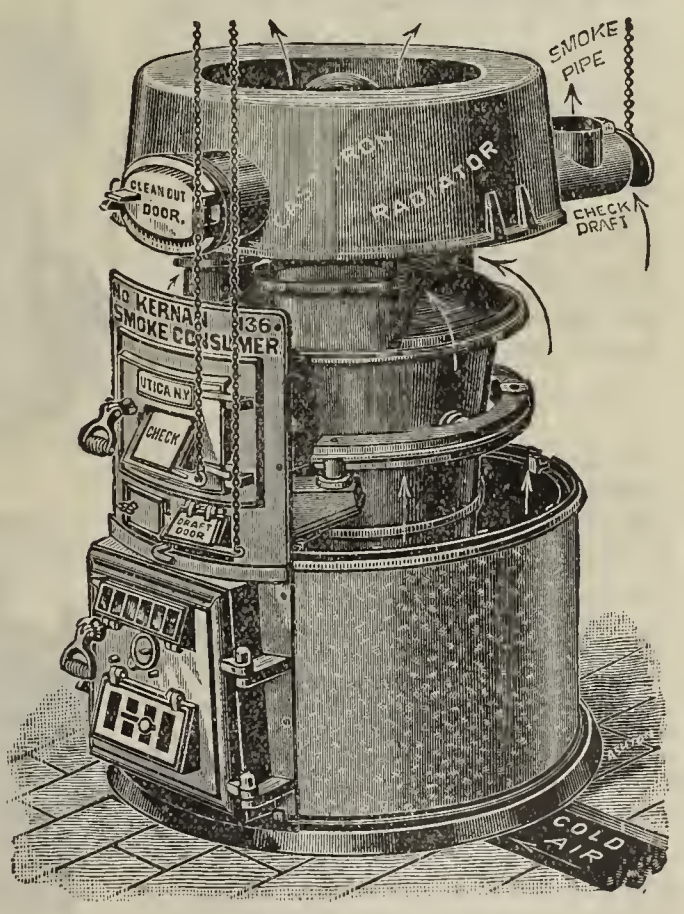
New Process. Radiators Always Clean.



The Air Box cast **INTEGRAL** with the Furnace Casting, No Joint, and the current of air heated before entering the Combustion Chamber. **No Soot! No Waste of Fuel!** Results proven by the hundreds that are in use.



Write for Prices.



KERNAN FURNACE COMPANY,

71 W. WASHINGTON ST., CHICAGO. UTICA, N. Y.



Ancient Pigs of Lead.

Some interesting relics of the mining industries carried on so extensively in Britain during the Roman occupation are unearthed from time to time in England. A recent find of a very fine pig of Roman lead on the moors near Matlock, in Derbyshire, is chronicled by the *Iron Steel Trades Journal* of London, which gives the following interesting description of the same: It weighs about 170 pounds, has an inscription on its upper face, and in all respects agrees with the numerous other pigs of Roman lead found in various parts of Britain. The inscription, divested of ligatures, is P·RVBRI·ABASCANTI·METALLI· LVTVDARES. The last word stands for Lutudarensis, according to the somewhat arbitrary Roman fashion of abbreviating by omission of final letters or syllables, and the whole means (the lead of) P. Rubrius Abascantus, of the Lutudarensian mine. Lutudarum, or (as we used to miscall it) Lutudæ, is a place somewhere in the lead districts of Derbyshire, near Matlock or Wirksworth, which has produced other pigs of lead labeled MET·LVT, METALL·LVTVD, and the like. Abascantus may be supposed to be the lessee of the mines, which were State property by Roman law. Lead mining appears to have been far the most important of the mineral industries of Roman Britain. It was carried on extensively not only in Derbyshire but in Flint, Shropshire, and on the Mendips, at which latter place the deposits, being on the surface and accessible, were soon worked out, despite a law to restrain production. It is curious that the Derbyshire mines are the only ones in Britain where private lessees are named. The pigs from all the other mines bear emperors' names; four out of five varieties traceable to Lutudæ resemble in a general formula that lately found; the fifth bears the name of Hadrian.

An Odd Fuel.

A strange fuel is used entirely at the planing mills of Wm. P. Keeley & Son, at this place, says the Phœnixville, Pa , *Republican*. The factory in the course of a day turns out large quantities of shavings, and these are carefully stored in the cellar. The firm also visit the various coal yards and purchase all the coal dirt available. The two, shavings and coal dirt, are then mixed, and constitute the fuel that furnishes the power for the huge plant. By this method the cost of fuel is reduced about one half and the firm dispose of their refuse at the same time. The two materials are excellent steam producers and work perfectly satisfactorily. Recently the firm ran short of shavings and they purchased several carloads in preference to purchasing soft coal.

— FOND MOTHER: "My daughters have received a thoroughly practical education; each of them is capable of making work for ten servants."—*Fliegende Blätter.*

"Heating and Ventilating" ILLUSTRATED

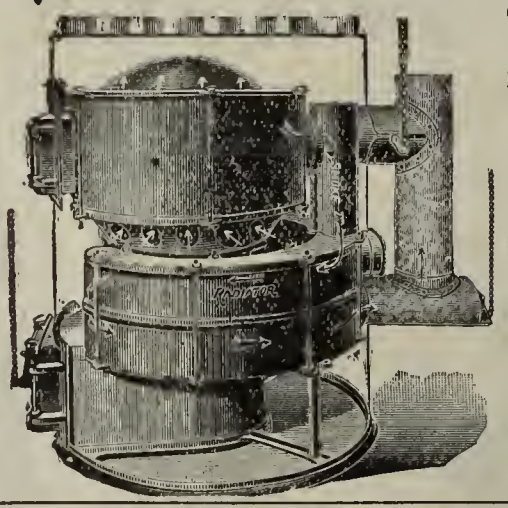
FOR SPECIMENS OF OUR WORK, SEE LATEST ILLUSTRATED CATALOGUES OF THE FOLLOWING WELL KNOWN HOUSES:

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BUFFALO, N.Y.
THE RAYMOND & CAMPBELL MFG. CO.
MIDDLETOWN, PA.
RICHMOND STOVE CO.
NORWICH, CONN.
H.B. SMITH & CO.
WESTFIELD, MASS.
DISBROW & CO.
HARRISBURG, PA.
PIERCE, BUTLER & PIERCE
SYRACUSE, N.Y.
HERENDEEN MFG. CO.
GENEVA N.Y.
LEBANON STOVE WORKS
LEBANON, PA.
AND MANY OTHERS.

BY
A. Mugford
ENGRAVER AND ELECTROTYPER
HARTFORD, CONN.

TRY OUR Designs and Effects THEY SELL GOODS

VICTOR WARM AIR FURNACE



THE DOME OR COMBUSTION CHAMBER HAS A CAST IRON TOP AND BOTTOM; COLD AIR FLUES INSIDE.
DOUBLE RADIATOR BELOW THE DOME; SECTIONAL FIRE POTS; STAR GRATE.

It Is a Base Burner.
It Is a Great Economizer of Fuel.
It Does Not Heat the Cellar
It Is a Low Furnace.

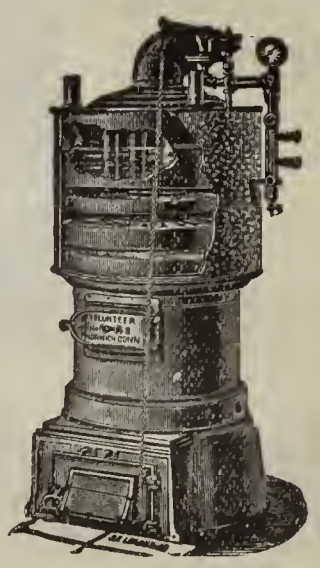
The "Perfect" Ventilator

The "Crown" or "Stasch" Folding Bake Pan.

Agents Wanted. Address—
The CORNING MANUFACTURING CO.,
CORNING, N. Y.

THE VOLUNTEER

STEAM.



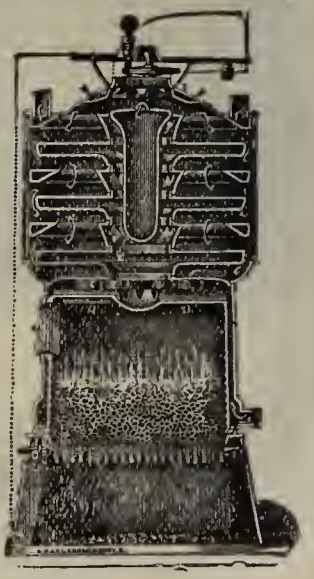
For hot water or steam has no superior, and is the only hot water boiler that is SELF REGULATING.

Send for our new catalogue, fully illustrated, testimonials, etc.

The Wm. H. Page Boiler Co.,
NORWICH, CONN.

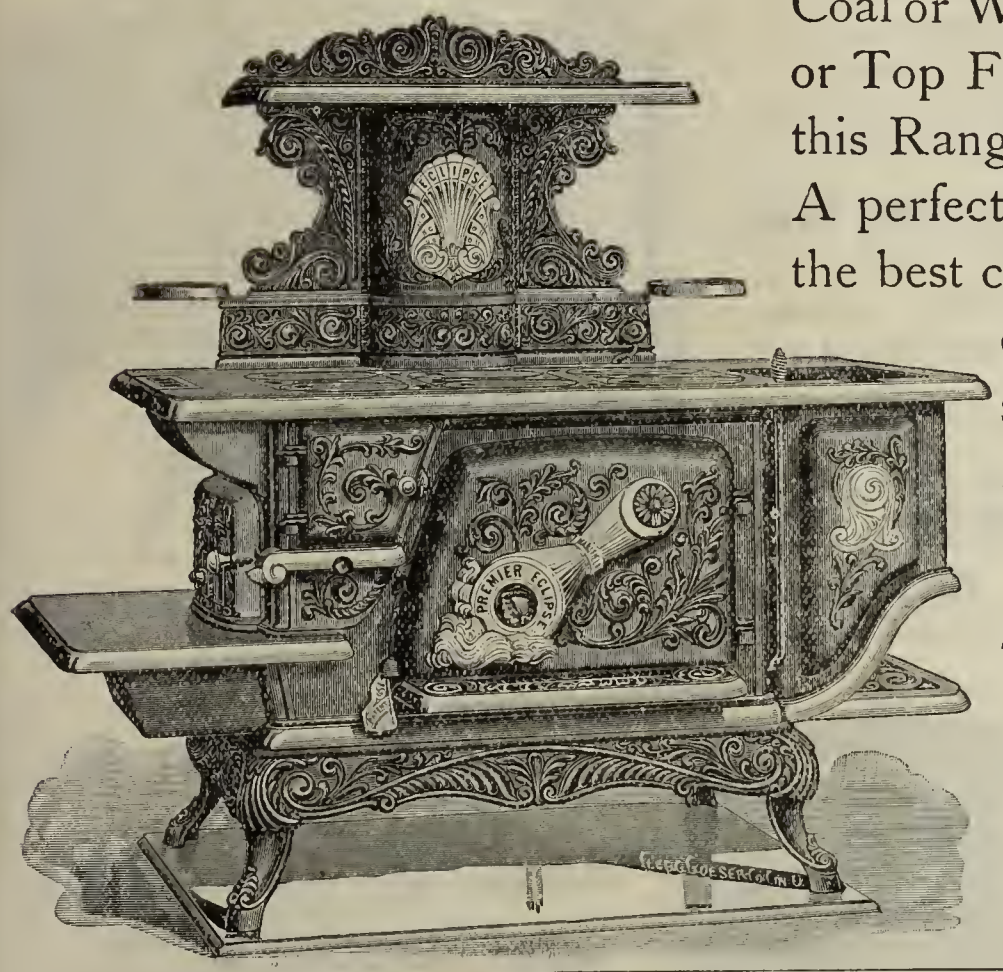
These boilers have a large sale in New England.

SECTIONAL VIEW, Hot Water



The Premier Eclipse

With Encased Bracket Reservoir and High Shelf. Six Holes. Coal or Wood. Two sizes. Pouch or Top Feed. Everything about this Range is New and Modern. A perfect Baker and Roaster and the best construction of the present time. The Dealer sells it on sight and it never causes complaint. Write for Catalogue.



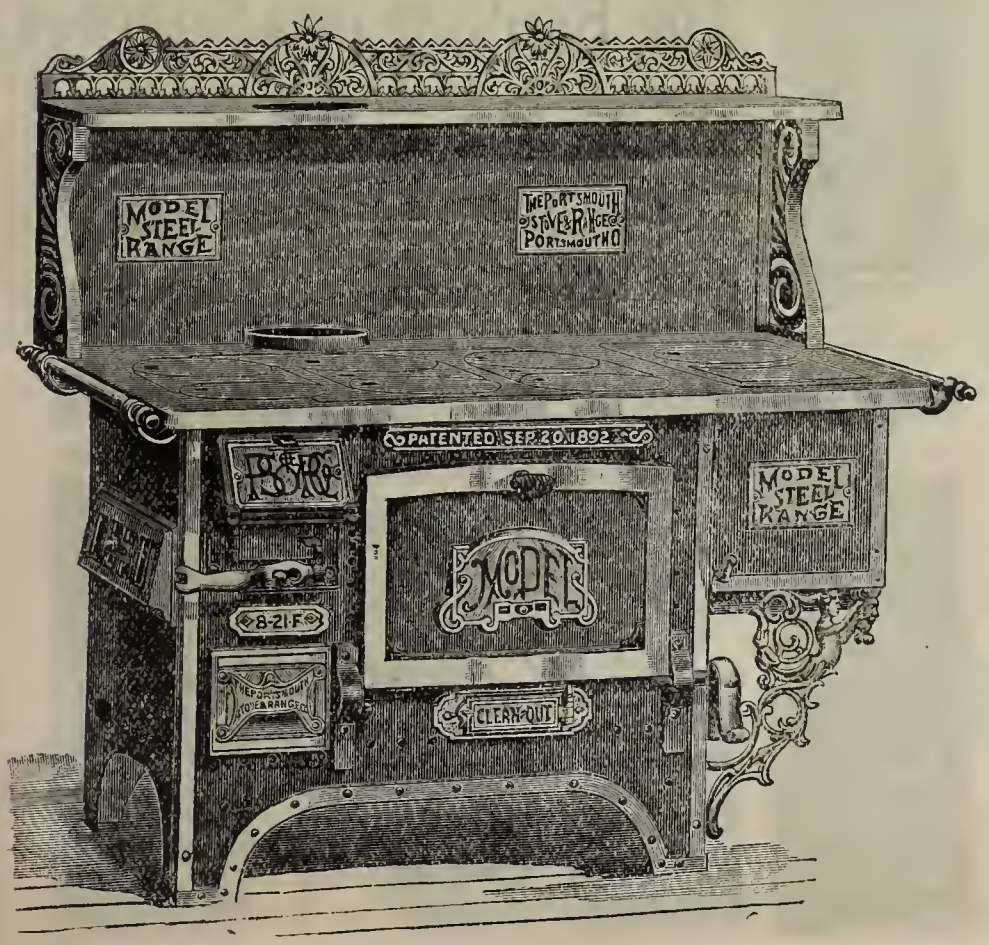
THE

Eclipse Stove Co.,

Mansfield, O.

The "Model"

With Flush-Top Reservoir.



WITH OUR VALUABLE ADDITION, THE

Rolling Damper,

which may be removed at will and permits entire freedom of draft. No rods, bolts or other parts in the way, to become loose or get out of order; something all have been striving for and the dealer has demanded It's the simplest and best of 'em all. The Model Ranges are the only productions of the kind embodying this and numerous other excellent features. Address for full particulars

The Portsmouth Stove and Range Company,

—MAKERS—

PORTSMOUTH, OHIO.

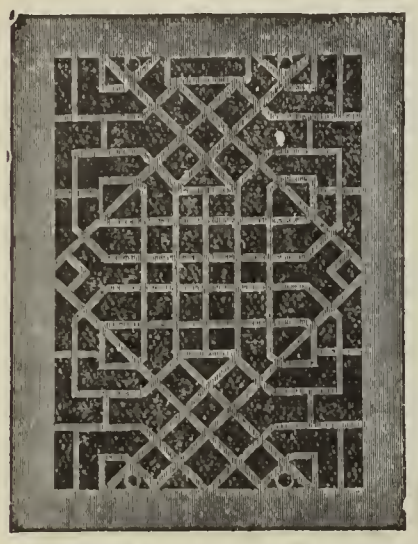
AGENTS:

R. ROBINSON & SONS, Chicago, for the Northwest.

A. L. CANFIELD, 284 Pearl St., N. Y. for New England States.

C. F. HAKE & SONS, for Cincinnati and Vicinity.





Warm-Air Registers, Ventilators, Etc.
Hardware Specialties.

BUFFALO REGISTER WORKS,
430 and 436 Niagara Street, Buffalo, N. Y

WM. HIGHTON & SONS,
MANUFACTURERS
Registers. Ventilators.



HUB PATTERN.

BOSTON, - - MASS.
—AND—
NASHUA, - - - N. H

INDIA MICA.
A. O. SCHOONMAKER,
IMPORTER,
158 William St. - NEW YORK.



No. 501 Mica Canopy can be used with any style of gas globe. For everything in mica goods, send for price-list to
The Mica Mfg Co
JOHN O'NEILL
Propr.,
89 Fulton St.,
N. Y.

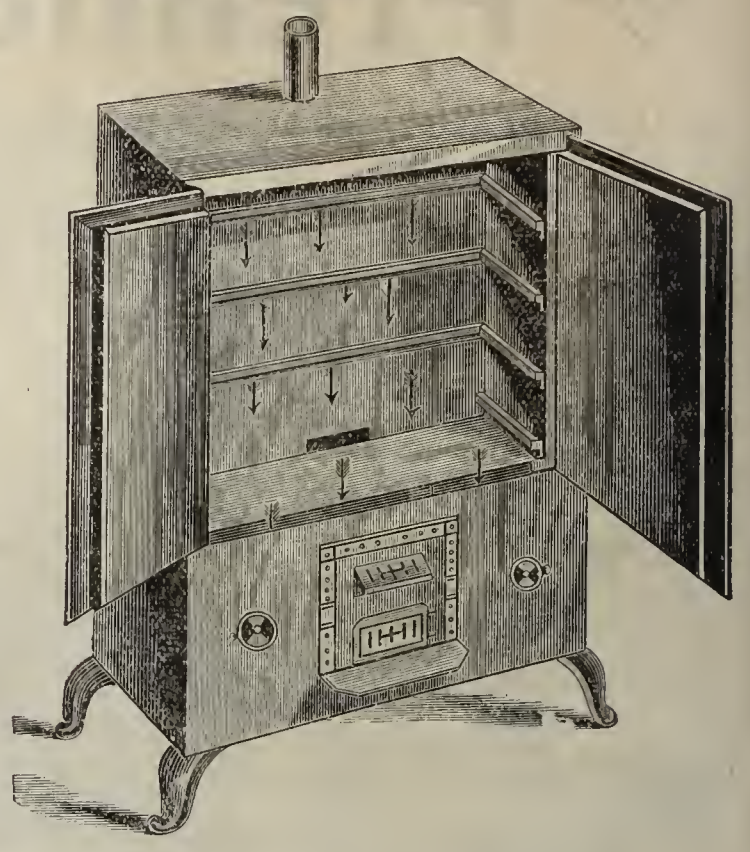
Blodgett's Patent Portable Oven.

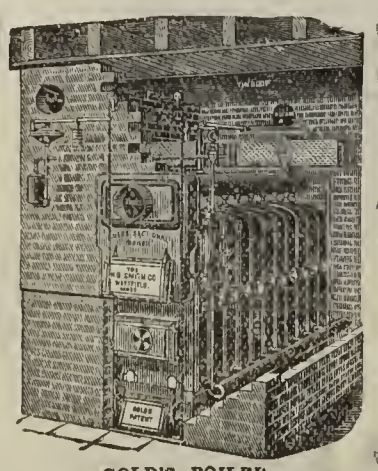
UNEXCELLED FOR
Hotels,
Steamships,
Confectioners,
Japanning,
Core Baking,
Public Institutions,
&c.

The Only Oven
BAKING BY
Perfect Circulation of Hot Air.

Made in ten sizes. | | Send for Catalogue.

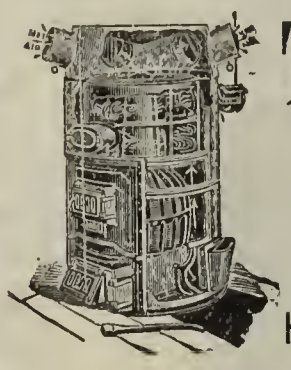
THE G. S. BLODGETT CO., MFRS
Burlington, Vermont.





GOLD'S BOILER

THE H. B. SMITH CO.,
MANUFACTURERS OF
Steam and Water
Heating Apparatus
FOR
PUBLIC BUILDINGS AND PRIVATE RESIDENCES
SPECIALTIES:
Gold's Improved Sectional Boilers,
Mills's Safety Sectional Boilers,
"The Union" Hot-Water Radiators,
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List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8⅛ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

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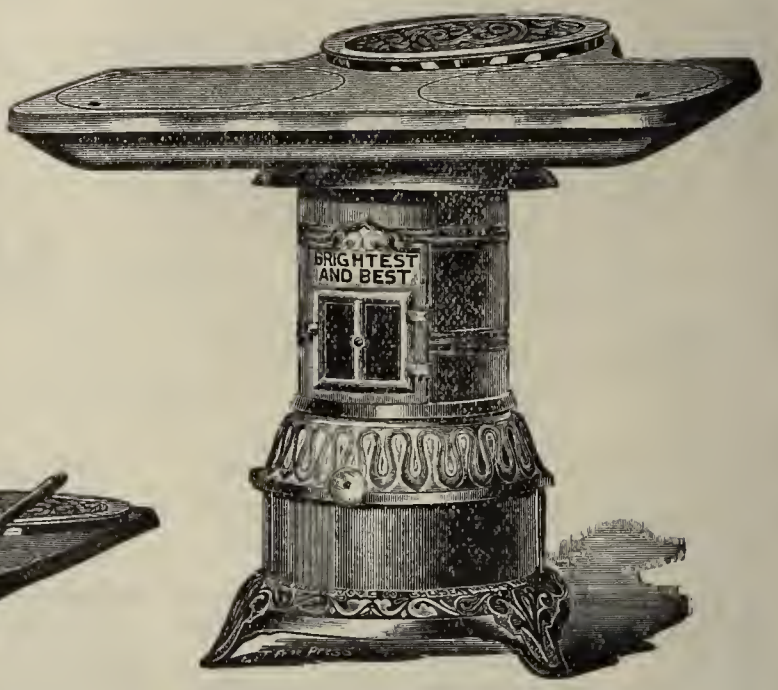
No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozen in box. Weight, 85 pounds. Height, 8⅛ inches. Size of Tank, 5½x5¾. NICKEL FRONT. Two 4-inch wicks.



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List Price, $24.00 per dozen. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8⅛ inches. Size of Tank, 5½ x 8½ inches. NICKEL FRONT. Three 4-inch wicks.



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Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.



No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**



No. 8. B. & B. Cook Stove.

Nickel Finish. List Price, $3.50. 7½ inch double thick circular wick.

It will pay you to consider these points.

We Are After Your Trade.

You will always find the B. & B. Stoves up to date in every particular.

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THE GLAZIER STOVE CO., Manufacturers, CHELSEA, MICH.

THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, June 2, 1894.

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BRITISH AGENCY: The Ironmonger, 42 Cannon street, London, England.

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Catalogues of Heating Apparatus.

Examination of a considerable number of catalogues and circulars of hot water heating and steam heating apparatus recently received, and a comparison of these with a number of catalogues issued from ten to fifteen years ago, shows that recent publications of this class have undergone a very marked improvement. Not only in their general design and execution as regards printing and illustration is this improvement manifest, but in the literary style and greater accuracy of statement. The heating trade is evidently getting down to a scientific as well as practical basis. In modern catalogues principles are recognized and correctly stated that, in the majority of cases, a few years ago, would have been either wholly ignored or, if the attempt to state them were made, would have been very clumsily or inaccurately set forth.

Efficiency of Heating Surface.

The difference in efficiency of heating surface in boilers, consequent upon its position in relation to the direction of flow of the flame and heated gases generated on the grate and its greater or less exposure to direct radiation from the burning fuel, together with the direction and rapidity of the currents of water flowing over the water side of the metal, is one of the principles now much more generally appreciated and understood than it was years ago. Mere extent of heating surface is no longer claimed by the more intelligent boiler manufacturers to indicate, of itself and independent of other considerations, superior economy of fuel or greater effectiveness in steaming than can be secured by a better design, though perhaps a smaller surface. The limiting conditions in the actual work of boilers are better understood and recognized. The proper relation of grate area to heating surface for high efficiency is much more generally observed.

Rating of Boilers and Hot Water Heaters.

But above all other indications of improvement in the publications of the heating trade, the disposition toward correct rating is, perhaps, the most notable and commendable. The heating trade has heretofore been wont to discount the ratings of boilers as given in catalogues, and perhaps will find it prudent to do so still, except in cases where individual experience has proved ratings to be reliable; but there now appears a tendency to rate boilers from actual test in average service. The exaggerations resulting from the guess work or enthusiasm of inventors, which some years ago taught steam and hot water men the necessity of extreme caution, are gradually disappearing from the statements of manufacturers, and much more reliable ratings are now generally made. Not that manufacturers have, as a class, willingly lent themselves to deception; on the contrary, they are reluctant, from principles of sound business policy, to overstate the efficiency of their boilers. But in some cases they have deceived themselves by improperly conducted experiments, and in others have accepted without due verification the statements of sanguine inventors; while the fear of underrating, and thus placing themselves at a disadvantage in the market, has often maintained boiler ratings at higher figures than experience has justified after the suspicion that the rating was too high has become almost a certainty.

Tests of New Boilers.

One reason for overrating has been the acceptance of results of tests of new and perfectly clean boilers, fired with the best fuel and worked under the most favorable conditions, as what may be relied upon in average actual service; or, if some allowance has been made for decrease of efficiency in actual use, a too low estimate has been put upon this decrease. Very few heating boilers, as generally cared for and attended, will, on the average, work within 20 per cent. of their efficiency as tested when new, in the manner named. The popular rating of a boiler will finally come from what it will do in ordinary practice; and if its listed rating varies widely from this, the fact soon becomes well known in the trade, and any temporary advantage in sales obtained from an exaggerated rating is sure to be neutralized by a reaction upon the reputation of both the goods and the makers of such statements.

Influence of Electric Light on Plants.

An interesting series of experiments made by the Hon. W. W. Rawson of Arlington, England, to determine the influence of the electric light upon the growth of plants, are mentioned by *Invention*, a London journal. Mr. Rawson claims, as the result of his trials, that he gains five days in each of his three crops of lettuce—that is, two weeks in a season—by using the electric light in his greenhouses. He states, further, that the gain on one crop pays all the expenses of the electric lighting for the season, thus giving him the gain on the other two as clear profit. His attention was, we learn, first called to the usefulness of the light by the advance made in the growth at the ends of his greenhouse next the street and in the glare of an electric lamp. This was so marked that he introduced the light throughout his lettuce and cucumber houses with the most satisfactory results. Dr. Baily, another English experimenter in this line, states as the result of his own tests that the influence of the light is greatly modified by the interposition of a glass roof. Plants injured by a naked light were benefited by the protected light. He found that five hours' light per night at a distance of 12 feet hastened the maturity of vegetables a week or ten days, although it proved injurious to young plants.

The workingmen's associations are now memorializing Congress to take immediate action to restrict immigration. This is a good movement. When workingmen take this matter up in earnest Congress will doubtless discover some more effective way of discouraging undesirable immigration than has yet been devised. The tide continues to flow this way too strongly, notwithstanding the supposed check given to it by the depression in business here.

Some of the members of the Toronto Board of Trade are a queer lot, remarks the *Canadian Manufacturer*. A few weeks ago they passed strong resolutions urging the Dominion Government to take vigorous action looking to the building up of the Canadian pig iron industry, and later they send a deputation to Ottawa asking that pig iron be placed in the list of non-dutiable articles.

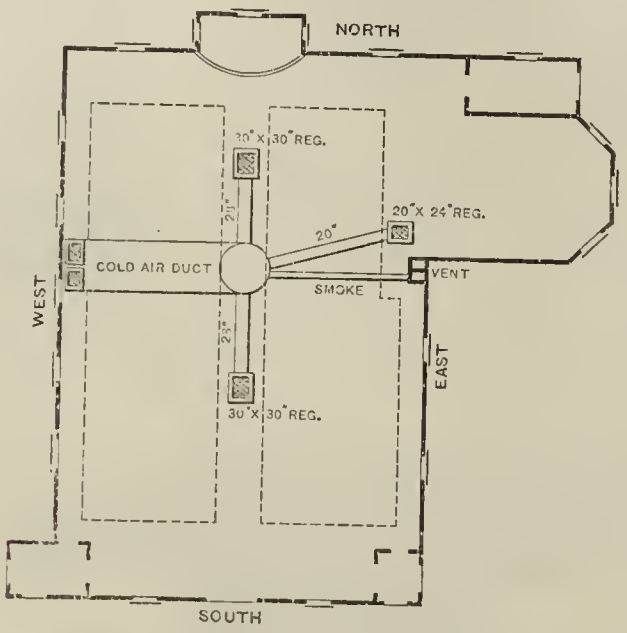
At the Watervliet, N. Y., arsenal gun shop on the morning of May 24, in the presence of a number of interested spectators, the jacket of a 12-inch gun was shrunk on the tube made for it. This is the fourteenth of 12 inch caliber that has been shrunk at the gun factory.

THE LETTER BOX.

Wants a Better System.

From Cæsar, *Louisville.*—In *The Metal Worker* of May 12 I note an article from "W. S. G.," Penbrook, Pa. The only comment necessary is that "W. S. G." did not roast the architect sufficiently. The plan offered by the latter is well calculated to heat cellar to about 100° and auditorium 40° to 50°. As this is not desirable I offer the following with diagram of adjustment. I would place furnace as per diagram and take the hot air through a 30 x 36 face plate and border directly over furnace. Ten feet toward front of building I would place a register having three-fifths of the capacity of the hot air register and with pipe of three fifths of the capacity of the hot air pipe, connecting it to a pit under the furnace. The other two-fifths of the capacity of the hot air register I would use in a pipe connected to pit under furnace and run to outside air. I would place vent register as designated and give both pipe and register the same capacity as the vent flue. Let "W. S. G." use faces and borders only on this job. Such a plant will heat this building with 25 per cent. of the fuel that would be consumed in plan offered by the architect. If "W. S. G." had done the proper thing in this case he would have firmly passed the job and refused to figure on it. It is not well for a heating man to waste his time on such jobs as the one offered, in which such dense ignorance of the laws governing warm air heating is displayed. It is my experience that it requires a full lifetime of close application to learn the entirety and details of our business, yet we find some people who after four or five years' experience have mastered the details of every business. Comment is unnecessary.

Penbrook, Pa., wanted a plan for heating a new church, I send herewith a rough sketch showing the furnace in center of the building, using two 28-inch pipes with 30 x 30 registers in main aisle, 20-inch pipe with 20 x 27 register in side aisle next the small room on the east side. We would arrange this furnace so as to take both inside and outside air, using inside air when first firing until the church is warm, then using outside air. He failed to give size of ventilator, consequently we do not know what sized duct should be made. The ventilating duct should be the same capacity in square inches as the size of the foul air flue. The duct or ducts can run to register on the side of the chimney 2 inches above the floor, or they can be sunk in any part of the building and conducted to chimney through wood boxes. We should be pleased to have "W. S. G." write to us for a catalogue.



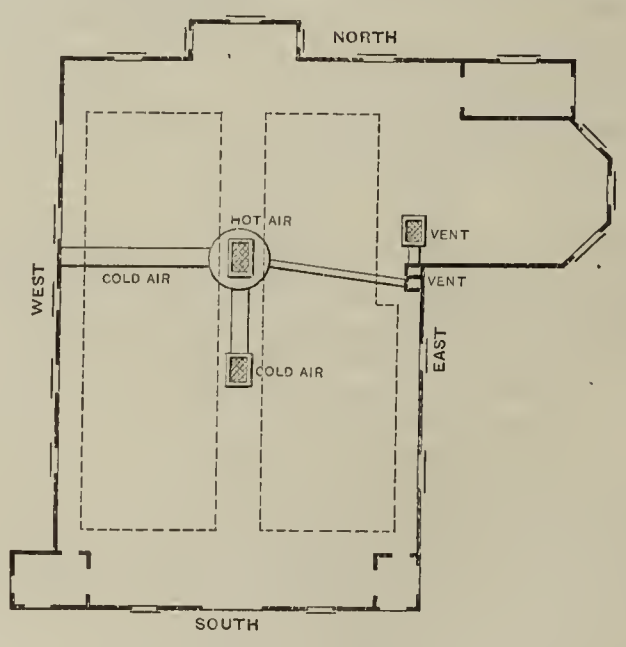
Wants a Better System.—Plan by Cæsar.

From Hess, Snyder & Co., *Massillon, Ohio.*—Noticing in *The Metal Worker* of May 12 that "W. S. G." of

Choked Water Backs.

From E. S. M., *Westminster, Md.*—In answer to "E. J. Y.," Regina, N. W. T., whose inquiry appears in *The Metal Worker* May 19, he may be interested in knowing that I have had the same trouble myself, and tried brass piping, thinking it might possibly help the matter, but it did no good. I then put the pipe where the hottest part of the fire would not strike it and have had no trouble with it since, which is over two years ago. It formerly filled up every month. The reason, I think, of the present relief is that the water got too hot and steamed, which it will not do if put where the coil will not be subjected to so high a heat. I know that the stoppage must have come from the water steaming, for the boiler would steam, and I think if "E. J. Y." examines his closely he will find that it also steams. Please ask him to publish the result of his experiments, as I would like to know if the same remedy would be effective with another coil.

From Swiped Joint.—A number of correspondents of *The Metal Worker* besides "E. J. Y.," whose complaint appeared May 19, find difficulty with choked water backs, which is a common trouble wherever hard water is used. A remedy for this might possibly be found in arranging the circulating pipes connecting the range boiler, and water back so that the same water would constantly flow through the back. Suppose the hot water pipe to boiler from back connected to top of boiler, then ran directly downward through center of boiler and out at bottom and thence to the range. This water would lose its heat while passing through the vertical pipe in boiler surrounded and in contact with colder water. The circulation would be constant and would convey the heat imparted to it in the back and lose it while passing through the boiler, thereby heating the water stored in the boiler doubtless



Wants a Better System.

quite as well as though it mingled with it. There being no introduction of new or fresh water laden with earthy matter, no deposit would form in the back or pipes to close them. There would necessarily have to be some way provided to keep these pipes full at varying temperatures and permit sufficient water to escape to prevent bursting the pipes when expanded under boiling temperature. It is practical, I believe, and has been done successfully. A young man interested with me in business piped a boiler in some such way a year or more ago and it has given satisfactory results so far. Here there is no need of such an arrangement and hence it is not done. The vertical pipe inside boiler might and perhaps should be larger than the exterior ones—say 1½-inch. I suggest that your correspondents try it.

Paper Backed Corrugated Iron.

In submitting the query of Caswell & Moore to the readers of *The Metal Worker* last week a mistake was made in the address. Their correct address is Caswell & Moore, 237 Bridge street, Phenixville, Pa.

Making Solder.

From S. E. B., *Chicago.*—Will you please publish in *The Metal Worker* the best brands of tin and lead for making half and half solder? Am I correct in supposing that bar metal is purer than pig metal?

Answer.—Some good brands of lead are Omaha, Globe, Grant, Pueblo and Pennsylvania. Tin is known as Straits, Banca, Australian, Billiton and Lamb & Flag. It is not generally considered necessary to order either of these metals by the brand to get a good article, as the metal houses handle only such as are adapted to the requirements of their trade. Aside from the possibility of bar metal having been refined by an additional melting, it is improbable that it is any purer than the pigs from which it is made.

Front Wall Traps.

From L J. S., *New York.*—I would like a little information on the use of a running trap at the front wall of a building. There has been a system of sewers put in in our town, increasing the amount of plumbing to be done. There are two firms here who do most of the work. One firm think it is proper to connect with the sewer and run a line of soil pipe through the house and up through the roof, having a trap in the main drain just inside the cellar wall. On the house side of the trap they run a 4-inch pipe to the outer air for the first fresh air inlet, commonly called a foot vent. The other firm think it is proper to connect with the sewer and run a line of soil pipe through the house up through the roof, omitting the tap and foot vent, saying that it is not necessary, as they do not do it in large cities such as Chicago and New York. I should like to know which system is proper.

Note.—We shall be glad to have our plumbing readers discuss the question of the use of a running trap and fresh air inlet. In looking over the ordinances of some 50 cities in different parts of the United States, we find that in two-thirds it is mandatory that a running trap with a fresh air pipe on the house side of it shall be used in all buildings. This is true of New York and Philadelphia. In a number of other cities no mention is made of the trap or foot vent. In Chicago a set of diagrams accompany their plumbing regulations, showing different methods of running the soil pipe and connecting with the sewer, and the use of a running trap and foot vent is not required. In Montreal the use of a running trap and foot vent is only permitted on special application to the authorities according to a set of regulations at hand. It is held by some that sewers and sewer air would be incapable of harm if the trap was omitted and additional ventilation was afforded by a pipe running from the main drain up above the roof inside of the front wall. Others hold that the foot vent coming up in the sidewalk is liable to stoppage by dirt or if not stopped it is dangerous to the passersby, because it discharges foul air, perhaps laden with disease germs, when any fixture in the house is flushed. Some think that the foot vent should be on the sewer side of the trap to protect the house and others think that it should run to the roof in all cases.

Remedying Defective Flues.

John Le Sauvage, 37 Duane street, New York, whose sign proclaims "defective flues a specialty," has had many interesting experiences with poor draft chimneys and smoky fire places. He says there are 101 reasons why chimneys fail to draw, and any one of them is sufficient to make trouble. In a large restaurant building eleven years ago the proprietor was annoyed by a lack of draft in his chimney, or, more properly speaking, smoke stack. Different chimney experts tried their skill in removing the cause of the trouble, but none was successful. The smoke stack was used in connection with two steam boilers, and in endeavoring to improve the draft one mechanic had used an exhaust fan on the roof in connection with it. This was arranged with a tight damper at the top of the smoke stack proper, operated by a chain running down through it to the basement. A tee connection was made at the side of the smoke stack and a round elbow then pointed down to connect with another round elbow running horizontally, into which the exhaust fan was placed. Beyond the fan another round elbow turned the pipe upward so as to discharge the air straight up. Even with this arrangement they were unable to get good results, and all due to the fact that where the horizontal pipe connected with the vertical shaft there was a contraction in the area of the flue, and the connection was made in such a way as to produce conflicting currents and undue friction. The smoke pipes running from the two boilers, which were equally distant from the flue, connected into a head at the base of the flue. All of this pipe was rectangular, and each of the smaller pipes was of ample capacity for the purpose and the head into which they connected was in proper proportion to their areas. On investigating it was found that the smoke stack was 30 inches in diameter and ran up through a square corrugated iron shaft as a means of protection against fire. To make the change at the base necessary for a good draft it would be necessary to take down the inside smoke stack, which was about 80 feet high, but an examination showed that the smoke pipe was so far weakened by corrosion that it would not stand taking down and a new pipe would therefore be required. On assuring the owner that the shaft could be made absolutely satisfactory, he decided to go to the expense of making the change suggested. A round elbow was made to connect with the square pipe and was continued square in shape well inside of the corrugated shaft. From the square end of this elbow the pipe gradually assumed a round form, and new round pipe was run to the top of the building. After the job was completed, which was done between Saturday night and Monday morning, fire was started in one of the steam boilers, and with the rapid draft now secured one boiler was amply capable of furnishing all the steam and heat required. The total cost of making the changes was $660, but the owner is well pleased with his expenditure and has stated that the saving in fuel alone will more than pay the cost in less than two years, and that one steam boiler is thus held in reserve for duty in case of accident or extra duty being necessary.

In another case a chimney ran up on the north side of a high building, and it was difficult at times to get an upward draft, particularly when there was a cold northwest wind, as the building was exposed on that side. On being called in to overcome the trouble, which was due to a cold chimney, Mr. Le Sauvage found that a new building would be erected next the chimney in a few months, and advised the owner to submit to the inconvenience in the mean time rather than go to the expense of insulating the flue. The new building was erected and the flue which previously was defective in operation gave excellent satisfaction. Another difficulty frequently found is due to the space in the chimney below where the pipe enters. In some cases no difficulty is caused by this space and at other times all that is needed to overcome the trouble is to stop off the chimney just below the pipe. A good way to stop off a chimney effectually yet not permanently is to insert through the pipe hole strips of heavy sheet iron long enough to wedge in the flue. Enough of them must be used to prevent ashes falling through. Then by filling in on top of the sheet iron with cinders and ashes an air tight stop is made. Such a stop can be easily removed when a stove is to be connected with the flue at a lower point. In a number of years practice Mr. Le Sauvage has accumulated a valuable fund of experience and is now seeking the flue that he cannot make operate.

Baltimore advices convey the report that a powerful association has been organized by leading capitalists, bankers and railroad officers in the South under the name of the Southern Immigration, Land & Title Company, the object of which is to develop and colonize Southern lands and generally to encourage and direct immigration and trade in the Southern States.

Continued dullness is reported as the prevailing feature in the dry goods trade throughout the country.

THE RETAIL STORE.

Electrical Devices as Hardware.

BY W. E. GILL.

It is only in recent years that electrical devices have come to be recognized as among the conveniences of the home and the necessities of the hotel, the business house, the bank and the factory. A few modern electrical inventions, notably among which are the telephone and the electric light, coupled with the energy and push of those engaged in the prosecution of electrical enterprises, have been largely instrumental in educating the public to a just appreciation of the value of electricity in domestic and business life. Electricity as applied to the liberal arts has become so extended in this country that a hotel without its guest call or a town without its electric railway, electric lights or the ubiquitous telephone would be considered commonplace indeed. Until recently electrical goods, with but few exceptions, have been handled and vended by manufacturers and dealers who made it their special business and who devoted their entire attention to the electrical industry. This was perhaps necessary while the goods were passing through their infantile period, and the same would apply to any like industry at the same stage. In many of its branches the electrical business will of necessity remain so, requiring as it does a special training to enable one to follow it successfully. There are, however, a great many articles and devices which are in constant demand almost everywhere, which have been so simplified as to render them staple.

WE WOULD CAUTION

the Hardware merchant who contemplates adding electrical goods to his already varied and diversified stock against going too far at the beginning. Location and the extent to which electrical enterprises are being carried on should have much to do with the choice of a line. Buy only from manufacturers or dealers of known and acknowledged reputation. There is, perhaps, no line of goods carried in stock by the Hardware merchant which he will be less able to criticise than his electrical stock. He must therefore rely upon the manufacturer or jobber giving him fair value in the goods they furnish.

THE INSTALLING

of electric railway and electric lighting plants, also fire alarm systems, is being generally carried on by companies organized for the promotion of some special system, the apparatus for which is usually patented or controlled by them. This work of necessity requires more or less scientific knowledge and men trained in special branches to perform the work. There is much, however, that comes within the scope of the Hardware merchant, and that could bear the same relation to his business that the tin shop and furnace department now do. The extent to which he should engage in electrical work of course depends upon existing conditions. In a locality where there are electrical fitters, the merchant might find it more profitable to carry limited stock of staple goods, so as to be able to supply the wants of the local trade, rather than to engage in competition with them. In this way he would avoid coming in contact with the consumer and avoid many of the petty annoyances incident to the electrical fitters' business and which arise from causes not under his control. All electrical devices depending upon a battery as the source of the electric current require

OCCASIONAL ATTENTION.

The battery must be supplied with water, and the elements when used up must be replaced by new ones. These simple matters are very apt to be neglected by the consumer, and when the electrical service fails, he invariably resorts to the fitter, who must needs make a trip to do what the consumer or his servant might have done had they been properly instructed. The merchant will indeed find more of these petty vexations to contend with in the electrical fitting department than in any other branch of his business. In the event of his adding an electrical fitting branch he should first acquaint himself with the simpler house appliances; the most common of which is the electric bell. There are manufacturers who have made a special study of the requirements of the Hardware trade in electrical devices for domestic and business purposes, and who put up and furnish in the most convenient form the goods which are in common demand everywhere, packing them in sets to suit most all ordinary requirements, and in such a form as to be readily stocked and handled from the shelf in the same manner that the merchant would handle a set of sliding door hangers or a set of store door handles and lock. The necessary directions are to be found packed with the sets, making it easy for a person of ordinary intelligence to put them in place in working order and to care for them without assistance from any one.

WHAT TO CARRY IN STOCK.

To start with, a merchant should place in his stock a few electric bell sets, such as are used for front doors and dining rooms in residences, for calls in office, banks, factories, stores, &c., selecting those sets which are packed with trimmings best suited to the requirements of his particular locality. These sets come packed with sufficient electrical wire for connecting up in any house of moderate size. In a great many instances, however, more wire will be required than is packed with the sets. It will, therefore, be desirable to carry some electrical wire in stock, such as is commonly used and known as No. 18 gauge annunciator, on spools of, say, ½ pound or 1 pound each, which sizes are regular; also ½-inch electricians' staples, in 2 ounce packages, packed one dozen packages in a box; and for repairs, some complete batteries and parts of batteries, such as battery zincs and sal ammoniac, in 5-ounce paper boxes or bags, one package being the quantity required for one complete charge for a single battery. A very simple, comprehensive and comparatively inexpensive sample for the salesroom may be made, using the wood box in which the set is packed, by screwing the cover to the back of the box, so as to extend above the box and mounting thereon the bell, wire and push, and placing the battery inside the box, all in full view; the battery then being charged and connected to the bell and push with the wire, and by pressing the push knob the bell will be made to ring, the current passing through the entire coil of wire. These electric bell sets should be on the shelf of every Hardware merchant, whether he does fitting or not, as they will meet the requirements of the average house builder or contractor in need of a simple electric bell, they being in the most convenient shape to handle and carry in stock. Should the merchant desire to engage in the

FITTING BUSINESS,

or carry stock for local fitters, he will find it convenient in addition to the sets to carry a limited line of electric pushes in bronze for out of doors, and wood for indoors; iron frame bells with 3-inch gongs for ordinary house and office use, and larger for barns, mills, factories, stores, &c., according to requirements; complete electric batteries and parts for same; No. 18 electrical wire on spools of ½ pound, 1 pound and 8 pounds each; ½-inch electricians' staples in 2-ounce, ½-pound or 1-pound packages; electric door connections for use on store entrance doors to indicate the opening and closing of the door; dining room pushes to be operated with the foot for calling a servant during meals, &c. The foregoing list comprises the goods which are in most common demand where electrical devices are used. There are other and kindred lines such as annunciators for hotels and residences and electric gas lighting apparatus which it would be manifestly unwise for the Hardware merchant to handle as a selling stock, and rather beyond his ability to handle as a fitter until he thoroughly understands how to install electric bells in their various applications. Regarding equipments and supplies for electric street railway and electric lighting plants, it would be impossible to here specify what goods might be advantageously handled, as local existing conditions and requirements and the knowledge of the merchant in these special branches of electricity will alone determine.

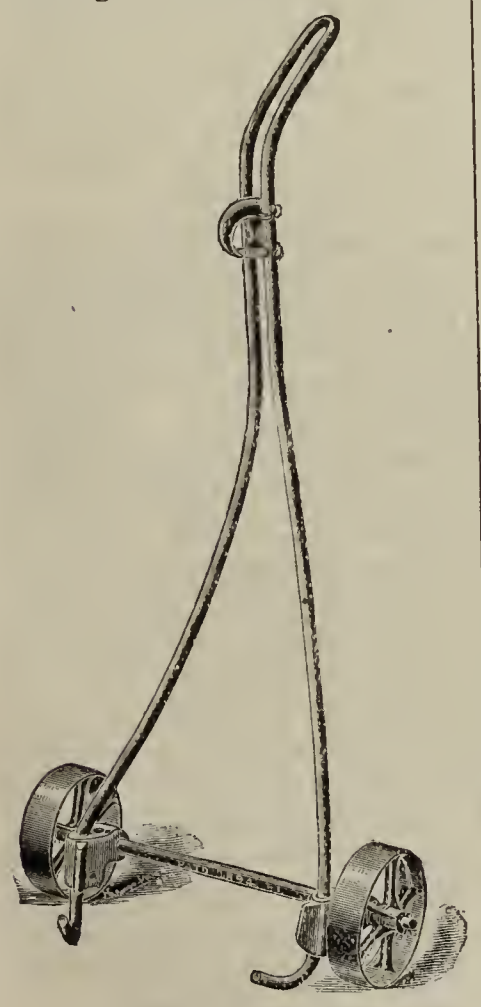
D. H. BURTIS of 27–29 East Washton street, Phenix, Arizona, is sending his friends in the trade a postal card, the back of which carries an advertisement of his line of specialties. The illustration with which it is embellished is unique in the extreme and self explanatory to residents of the section where Mr. Burtis does business. The line of goods which he carries includes stoves, ranges, pumps, tin, granite and copper ware, gasoline and oil stoves, sheet and corrugated iron, brass goods and fittings, and he is sole agent for the Blake steam pumps, Champion mowers, Johnson's self dump rake, Wilson's steel headers, Garlock steam packings, &c. Mr. Burtis states that he operates in connection with his store a thoroughly equipped tin and plumbing shop.

THE UNITED STATES GRAPHITE COMPANY of Saginaw, Mich., have received

some particularly fine lumps of graphite from their Santa Maria mine in Mexico. E. C. Ewen, manager of the company, states that owing to the extreme purity and consequent softness of the material, it is very hard to get it from the mine in large pieces. When it is considered that their mine is over 30 miles from the railroad, and the material, after being mined and sacked, is then hauled in ox carts over 30 miles of rough road, then loaded into a car and transported nearly 2500 miles to Saginaw, it is remarkable that the lumps reach that place in such good condition. Mr. Ewen spent a large part of the past winter at the mine, and it was under his supervision that the lumps were taken out and handled through to Saginaw. It is the intention of the company to carefully pack these lumps and distribute them among some of their friends and customers.

Little Giant Steel Truck.

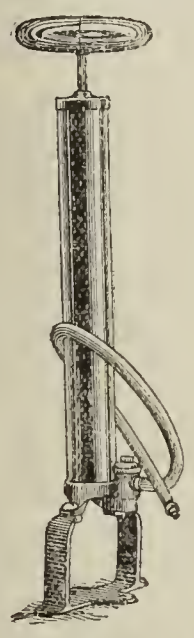
G. L. Van Namee Mfg. Company, Syracuse, N. Y., are offering the truck herewith shown. The truck is made entirely of metal, with wide tired wheels and well fitted bearings. It is provided with a self adjusting hook to secure the barrel at the top, also a clamp to prevent the axle from turning. The claim is made that the truck occupies but little space, and that while combining great strength it is in construction comparatively light, its total weight being 14 pounds. It is adapted for use in factories, stores, flour mills, &c., also for removing ash and garbage barrels. The above company are owners of the Little Giant Truck Company's plant.



Little Giant Steel Truck.

The Cyclone Pump.

The Davis & Stevens Mfg. Company, Seneca Falls, N. Y., are putting on the market the bicycle pump here shown. The pump cylinder measures 1½ x 12 inches, nickel plated, provided with a turned brass plunger, ¼ inch thick, and with a cupped plunger leather so, it is stated, that it does not cut out the cylinder. The pump has a base of malleable iron, by which it may be held by the foot or screwed to the floor. The base is attached to the pump by bolts and nuts, and may be easily detached for close packing or when carrying the pump on the wheel. With the pump is furnished a small hose, with a coupling to fit all nipples, or larger hose with a thumb screw coupling to fit all tire valves without using any nipple The point is made by the manufacturers that the pump is strong, durable, convenient and cheap.



The Cyclone Pump.

The Dickson System of Heating and Ventilating School Buildings.

H. Sandmeyer & Co., Peoria, Ill., furnish us the following description of the Dickson system of heating and ventilating, as applied to school buildings.

The object of the inventor of this system is to circulate enough air in each schoolroom to give each pupil 2000 feet of air per hour without mechanical power. We make no pretensions to ventilating in summer only by opening windows and doors, and confine ourselves to the problem of winter ventilation; in other words, to heat and ventilate a schoolroom during that season of the year when fire is needed to warm the rooms and the doors and windows are kept closed.

To better describe the system we will consider it in connection with one room of a school building. We first ascertain how large a flue it will take to deliver a certain amount of air in the room in a given time heated to a given temperature in order to properly warm the room. Having thus provided a way to bring in the required number of cubic feet of air to properly heat, we must now construct a flue of suitable size to take out the same amount of air in the same time as is required to bring it in. The incoming air must not be heated to over 175° and the outgoing air must not be lower than 60°. The warm air must enter the room 8 feet above the floor and the foul air be taken out at the floor line. A flue to exhaust 100,000 feet of air per hour must be provided with heat in order to cause a rapid upward current at all times. In order to heat this vent flue economically and without any special appliances, we construct a heat and vent flue side by side, one side of the heat flue making one side of the vent flue. The material composing the partition which separates the heat and vent flue is sensitive to heat, such as copper, and the heat that passes through this partition is sufficient to keep the vent flue in operation at all times. To provide for ventilation when but little fire is required we provide an opening in the partition between the heat and vent flue, and by opening a damper all the heat from the heat flue is thrown into the vent flue, which causes a rapid upward current sufficient to ventilate in murky, bad weather, when but little fire is needed. By placing the heat and vent flues side by side we have what might be called an aspirating flue. By introducing heat at the bottom of the heat flue, with a proper cold air supply, we complete the system for one room.

If we have two or more rooms all that it is necessary is to simply duplicate the system for each additional room. Cold air rooms are provided in the basement of sufficient size to guarantee an abundant supply of air at all times. These rooms are supplied with air from large openings in the four different sides of the building. By the Dickson system of heating and ventilating a separate system is provided for each room, and the opening of a door or window in one room does not affect the heating and ventilating in any other room. By this system we can circulate 100,000 feet of air in each room per hour in any sized school building from one room up. Either steam or furnaces can be used to provide heat.

It would seem by this arrangement that it would require a large number of flues or chimneys, but such is not the case. True, it requires a heat and vent flue for each room, but the heat flue for the first floor makes a vent flue for the second floor, and the heat flue for the second floor makes a vent flue for the third floor. By this arrangement it only requires two chimneys for an 8 or a 12 room building. The vent flues must extend high enough above the apex of the roof so as not to be affected by the winds.

The Dickson system of ventilation is applicable to any kind of a building, and it has been introduced into schoolhouses of all kinds and opera houses and churches. The success of the system depends entirely upon the construction of the heat and vent flues. By the construction of the flues as here described, the required 2000 feet of air can be obtained without mechanical power.

European journals note that there is at present being established at Constantinowka, in South Russia, a large iron and steel works by a company formed in 1891, with a capital of $2,000,000, and known as the Forges du Donetz. The works will include a large Bessemer steel making plant, a rail rolling mill, foundry, forge and an engineering shop. The plant will, it is expected, be put in operation this year, and it is stated that orders have already been secured for the supply of 100,000 tons of rails to the Russian State railways during 1895-6-7.

The Italian Government has issued a circular warning its citizens against emigrating to the United States. It specially indicates the States of Pennsylvania, Maryland and Delaware as places where employment is difficult to procure.

Press Working of Sheet Metals.—VII.

BY OBERLIN SMITH.

Drawing Process.

The drawing process for sheet metals, by which deep cylindrical, conical and other cup shaped articles are made seamless from a flat sheet, is very different from the ordinary forming process used for shallow articles of like general nature; or, to speak more accurately, it is an amplification of the same, embodying certain new and entirely different principles. It is in its nature as interesting as it is unique. It is, moreover, a comparatively new process, probably dating back not more than 50 or 60 years. As near as I can learn it was first used in America by Mr. Grosjean of New York, who informs me that he thinks it was practiced in France over half a century ago. I am informed by Mr. Neidringhaus of St. Louis that the Prussian system of metal drawing, as it is called, was invented at Saarlouis, Rhenish Prussia, by the Strouvelle Brothers. It probably was not practiced on a large commercial scale in this country much earlier than 1866, and the first presses were made here by a Mr. Marchand, who had been employed by Mr. Grosjean and his associates.

This process is sometimes called "stamping," which term, however, is a misnomer, being improperly used to designate something which is the successor of the old stamping process, but entirely different from it. The latter was practiced for many years in the production of various seamless utensils, such as pans, bowls, plates, cups, &c., which were gradually coaxed down into shape, so to speak, by frequently repeated blows in a drop press.

Sheet metal drawing proper consists in so confining a certain outer zone of a blank which is to be drawn into a cup like shape between two rigid flat surfaces that the metal cannot wrinkle when pulled radially inward, which it attempts to do on account of the constantly decreasing circumference of its edge. In Fig. 231 is shown, in vertical axial section, a pair of combination push through drawing dies, such as are used for any plain cylindrical articles of medium depth, such as blacking boxes, can covers, clock cases, &c. They consist of a lower die, L, an upper die, U, and a drawing punch, P. They are shown with a cutting edge, *c c*, for which reason they are termed "combination dies"—as a sheet laid between them when U descends is first cut into a blank, as shown in two views in Fig. 232. They could, however, just as well be used for blanks already cut, the edge *c'* being in such case somewhat rounded off to facilitate easy entrance of the blank, and remaining to serve the purpose of a gauge merely. Where blanks rather than whole sheets are used, this gauge ring may be omitted and gauge pins substituted therefor, as in Fig. 240, at G G. In some kinds of work no gauges are used except the fingers, the top surface of the die being made of exactly the same size as the blank, to facilitate adjusting in this way.

The operation of these tools is as follows: The die U descends until the blank is firmly clamped between it and the die L, at which time U stops, the ram of press being provided with a proper dwell until the punch U has had time to descend, forming the work gradually to shape, as shown by its successive stages in Figs. 233, 234 and 235. The punch then ascends, the work being prevented from rising by the sharp, hard stripping edge S. The slight expansion of the top edge of the work by its own elasticity is usually sufficient to prevent its pulling up through the die again. In some cases, however, there is a tendency to do so, which can be prevented by three or more spring pawls inserted in the die at a point below S.

In all work of this kind it is important to vent the punch by an air hole of ample size, somewhat as shown in Fig. 243, as otherwise there is a tendency for the work to be drawn upward by suction. This vent has been omitted from the other engravings.

It is evident that if the die U remains stationary during the drawing of the work, the thickness of the flange thereof—that is to say, the flat part from the edge inward, which would be the rim of the inverted straw hat, so to speak, represented by Fig. 233—must remain of the same thickness as the original blank; and therefore the sides of the finished cup, Fig. 235, as well as its bottom, will remain of uniform thickness—that is, if there happens to be sufficient room between the sides of punch and die, so that the metal is not squeezed thinner. It may be said that the die U might be easily forced upward by the attempted thickening of the metal, the press springing open to allow for the same. This is true, but in practice the fact is that the thickness is changed but little. We have, therefore, in this process an interesting action taking place in the flange, viz., the throwing together—in blacksmith's parlance the "upsetting"—of the metal in a circumferential direction, while a pulling apart or stretching action is going on in a radial direction, and that to an amount, as experience proves, just about sufficient to balance it.

This action is very prettily shown by a graphic method. Four small dots arranged in a square are marked upon the blank, as in Fig. 232, and this square will be seen to have elongated itself radially and shortened itself circumferentially into the form of a diamond during different stages of the work, becoming a very elongated one at the last. The same action is shown in Figs. 249 and 250, which were photographed from an actual piece of drawn work about 5 inches in diameter by something over 2 inches deep, the blank for which was made of decorated tin, upon which were ruled cross lines, as shown. The new relations of these lines to each other upon the sides of the cylindrical cup tell the story far better than mere words can do.

There is evidently here an interesting instance of the cold flow of metals, the molecules thereof being obliged to move freely among themselves and arrange themselves in new positions. Such flow takes place, as experience proves, without weakening the metal, it merely growing somewhat harder in the same way as it would in any hammering or rolling operations. This subject has been previously treated by the writer in a lecture delivered by him before the Franklin Institute, entitled "Flow of Metals in the Drawing Process," which was published in the journal of the institute for November, 1886. From it I quote the following paragraphs:

"Common instances of elastic flow may be found in the wonderful stretching of a piece of india rubber to perhaps ten times its normal length and its indignant return to exactly its original form, or in the bending or twisting of any wooden or metallic springs, &c.

"Instances of non-elastic flow are observed most frequently perhaps in connection with semi-solids, such as the clay upon the potter's wheel, the dough in the hands of the housewife, or the putty under the glazier's knife. In the apparently rigid solids such action is not popularly conceivable, but a little observation will show that the cold forging of a piece of iron, or, indeed, any bending or other permanent distortion of any piece of metal, could not occur without this flowing of its molecules among themselves. Such flowing is shown on the grandest scale known to our present experience (whatever may have happened in the mighty workshops of geological science) in the glaciers of the Alps, where great masses of solid ice flow slowly down their confining channels, changing their shape of cross section as needs be without being crushed or suffering any disintegration of their substance. This has been well described by Professor Tyndall, and it is, if I remember rightly, the same distinguished prowler about Nature's portals who tried the very interesting experiments regarding the flow of foreign objects through solid pitch without leaving any holes in it. I could not find the description of this experiment the other day in any books that I had at hand, but I believe it was as follows: A number of stones were placed upon the top of, and a number of corks underneath, a mass of pitch several inches thick, and abandoned to their fate. After several months of silent disappearance the corks arrived at the top and the stones at the bottom of the pitch, having floated and sunk respectively to their natural destinations.

"In looking for the flow of solids in the metallic arts it will be well to omit all hot processes as dealing with semi-fluids; but familiar examples of cold flow may be seen in wire drawing, tube drawing, cold rolling and hammering, lead pipe making, sheet metal spinning, &c.

"The first two mentioned are obviously analogous, about the only difference being that the tube is hollow, usually with a mandrel inside of it, while the wire is solid. Very similar to these operations, as respects the direction of flow of the particles of metal, is the reducing of a rod in grooved rolls, the chief difference being that the metal is coaxed along by friction, so to speak, instead of being pulled by its finished end. In hammering a bar the tensile stresses are entirely omitted and the action is wholly compressive, in a lateral direction, of course.

"In lead pipe making we have also an entirely compressive action, but one very different from that in the last named process. Here the lead is squirted out, as it were, much after the manner of a syringe, or a sausage stuffer, or one of those curious but really excellent squirting brick machines. . . ."

In Fig. 236 is shown a pair of conical drawing dies, the blank and successive stages of the work being shown respectively in Figs. 237, 238 and 239. Perspective views of finished work from dies of this sort are shown in Figs. 254 to 257, inclusive. Large sized dies of this kind are usually made of cast iron, without cutting edges, the gauging being done by hand as before mentioned. Where there is considerable taper to the work, it is removed by the hand of the operator grasping it inside and lifting it merely by friction as he pulls it upward and sidewise. The presses for

doing this are run very slowly, with continuous strokes, not stopping by the clutch with the ram in up position, as is usual with smaller presses. This is, of course, somewhat dangerous, as a man's arms would be crushed to a jelly were he to fail in keeping time with the motions of the press, even perhaps by the fraction of a second. It is rarely, however, that accidents of this sort happen.

cause it to stick fast and thus prevent a free delivery. In Figs. 258 and 259 are shown perspective views of a bowl and cup made in dies of this sort.

Depth of Drawing.

The depth of work attainable by the drawing process depends upon various conditions, among which are the kind and toughness of metal, the thickness thereof in proportion to the diameter, shallowness which are sometimes very provoking. Silver and gold are well adapted for deep work, but I cannot learn of the latter metal having been tried for anything as large as a churn. Recent experiments in the drawing of aluminum show it to be well adapted to the process. It is especially convenient on account of working without so frequent annealing as is necessary with brass, iron and steel, &c. Its tensile

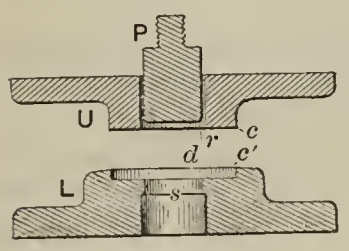


Fig. 231.

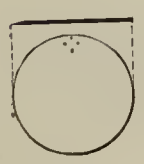

Fig. 232.


Fig. 233.



Fig 234.



Fig. 235.

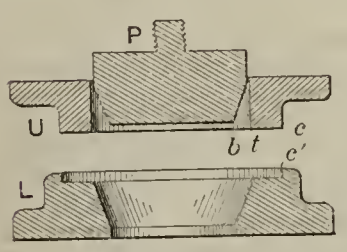
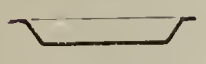
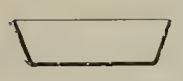


Fig. 236.

Fig. 237.


Fig. 238.


Fig. 239.

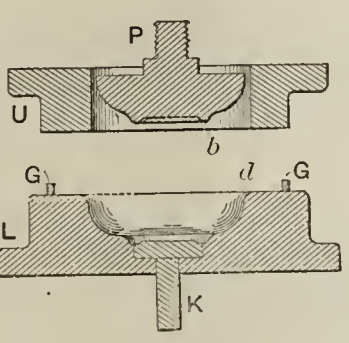


Fig. 240.

Fig. 241.


Fig. 242.

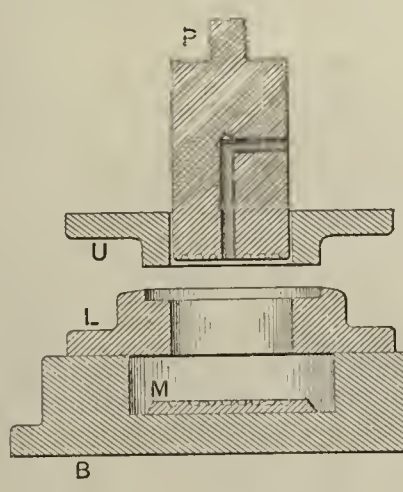


Fig. 243.

Fig. 244.

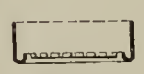
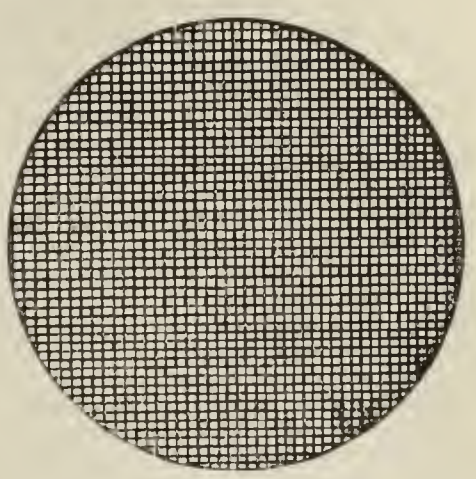
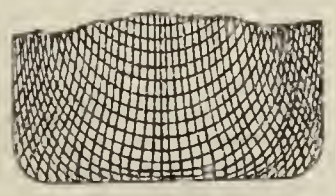

Fig. 245.


Fig 246


Fig. 247.


Fig. 248.


Fig 249.


Fig. 250

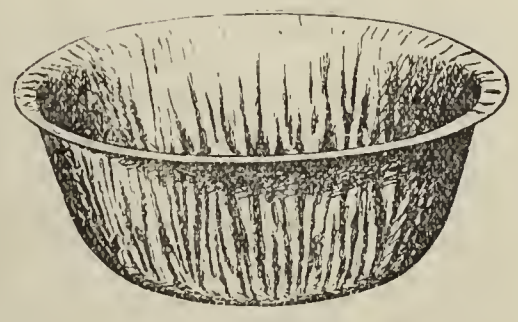

Fig. 251.


Fig. 252.


Fig. 253.


Fig. 254.

PRESS WORKING OF SHEET METALS.

In Fig. 240 is shown a somewhat similar pair of dies, except that they are provided with a knockout, K, which rises at the proper time by a spring, or automatically by the motion of the press. Such knockouts are of course used in dies of either of the forms described and they are sometimes omitted in the bowl shaped work (see Fig. 242) made in the dies now under discussion. The necessity of such a knockout is of course dependent upon whether the work is steep enough at any place to the smoothness of the dies, &c. I have known small articles to be drawn at one operation from a good quality of one cross tin plate, which is about $\frac{1}{64}$ inch thick, to a depth equal to one-half their diameter. Occasionally this proportion has reached two-thirds, as for instance a 3-inch round box 2 inches deep, &c.; but such would be an extreme case. Brass, German silver and copper can usually be drawn somewhat deeper, while zinc, on account of its tensile weakness, has limitations of strength, however, being somewhat less than brass, prevents so great a depth being obtained at one operation. In some experiments conducted by the writer in drawing cartridge shells of this metal, it showed itself most excellently adapted to the purpose, as it is also to all sorts of cooking utensils, which are drawn without difficulty in the ordinary forms. These, on account of their healthfulness, lightness and beauty, are, I think, destined to undergo an enormous development.

To quote again from the lecture before mentioned and referring to Fig. 231:

"A little study of the work which is being done in a die like this will show why a limit of depth is soon reached. The actual work consists, firstly, of molecular friction, or the causing to flow among themselves of the particles of metal in the flange before it turns the corner *d;* and secondly, in overcoming the friction between the upper and lower sides of the metal and the flat surfaces of the dies. If we imagine the part of the work which has become cylindrical to be a series of little ropes (forming the elements of the cylinder) which are attached to the punch by running across under the bottom of it and thence up its sides to the corner *d*, we will see that all the resistance offered in the flange is being overcome by the punch pulling these ropes downward over the corner *d*, it acting as a stationary pulley block. Hence if the united tensile strength of all these little ropes is great enough to overcome the resistance at its maximum, which is soon after the metal begins to flow, when the flange is at its widest, perfect work will be the result. If, however, there are not enough ropes to do this work, which is the case when the diameter at *s* is too small, the flange will not start to move, but the punch will simply go down and tear the bottom out of the work. Thus if we try for too great a depth relatively to the proposed diameter the work will be spoiled, because this means a wide flange and more resistance.

"It is evident that the little ropes spoken of will render more easily about a large corner than a small one, and that therefore a better result may be obtained by increasing the radius of the drawing corner *d*. If, however, this is carried too far, a considerable part of the flat holding surface of the lower die is lost, and a new evil arises, known as body wrinkles, which will be explained further on. Practically, for working tin plate, the radius of the corner *d* is made from $\frac{1}{8}$ to $\frac{1}{4}$ inch. The curvature of the corner *r* upon the punch also affects the result. If it is made perfectly sharp it tends to cut the metal which is pulled around it, and practically ought not to be less than $\frac{1}{16}$ inch radius. It is often much larger than this to suit shape of work desired, but if made very large causes the trouble of body wrinkles before referred to, on account of there being a certain zone of the blank which is unconfined by the flat holding surfaces."

In conical work like Fig. 239, or with approximately spherical shapes like Fig. 242, the blank is evidently unconfined over a certain annular zone lying between the lower corner of the punch *b* and upper corner of the lower die *d*, represented in general by the distance *b t*, Fig. 236. As the inner portions of the flange enter this zone and pass inward over its surface they are obliged to become smaller in circumference. There are here no clamping die surfaces to prevent wrinkles, which are therefore naturally formed and carried down into the conical portion of the work, as shown in Fig. 251, which was photographed from an actual wash bowl about 10 inches diameter just as it left the dies. These are known as "body wrinkles," in contradistinction to the flange wrinkles which sometimes occur when the upper and lower dies are not set tightly enough together. The former are usually removed by roller spinning in a special lathe. They are apt to occur in almost any of the utensils shown, except perhaps in work like the pie plate, Fig. 254. This is so shallow that they only barely begin to form, especially as the flange can be clamped very tightly in proportion to the depth, so that there is a tendency to pull out these incipient wrinkles by the actual stretching of the conical body of the work. There are other cases where wrinkles do not form objectionably on account of the work having very little taper, as in Fig. 257.

In Figs. 252 and 253 are shown common forms of cake pans, which illustrate body wrinkles when systematized and intended purposely to remain. These are the easiest made of all forms of deep work and do not require a holding die at all, being made without trouble in a single action press.

In conical work the difficulty in regard to getting enough tensile strength of metal to pull in the flange is often greater than in cylindrical, as the hypothetical little ropes spoken of in the above quotation are still fewer in number around the small circle whose perimeter is at *b* than they would be in the larger one at *t*, with a cylindrical punch. In general, therefore, work with a diameter at the bottom small in proportion to the extreme diameter of the flange is difficult to draw. This is shown in Figs. 246, 247 and 248, where there is a great deal of work going on in the vicinity of the flange in comparison to the amount of strength around the point of the punch to do the pulling.

Multiple Drawing.

It is evident that the resistance to be overcome in this process is due to both surface friction and molecular friction, or resistance to flow. With such conical articles as bowls, pans, &c., which do not require to be absolutely of uniform size, advantage is taken of this division of friction by drawing two or more together—sometimes as many as four. In such a case the surface friction is no greater for four than for one, as there are but two surfaces sliding against the dies. The molecular friction is, of course, four times as great as with one, but the sum of these frictions is obviously less than with one in proportion to the tensile strength of the work around the punch, which is as the number of thicknesses involved. There is, therefore, a considerable gain in strength, and deeper work may be made than where one is drawn at a time.

It is customary to remove the several thicknesses together from the press, sometimes spinning them in this condition, after which they easily drop apart. Obviously this could not well be done with cylindrical articles, as the difference in diameter would be too apparent, and, moreover, they could not be easily separated.

Referring again to the condition of the dies, it is very necessary, in order to avoid surface friction, that they be made exceedingly smooth and that the flat surfaces should be truly parallel, thus giving a space of uniform thickness between them. It is better to polish the clamping surfaces radially, rather than to leave a lathe polish upon them—a quite perceptible difference in preventing the metal from cracking sometimes appearing under such conditions.

Lubrication, which in certain cases is needed with various other kinds of dies referred to in this treatise, is always necessary to a more or less degree in drawn work. Sometimes oil is the best material — either applied occasionally to the dies or smeared in a thin coat over the sheets or blanks, or some of them. Soap suds works well for brass, and there are a variety of special prepations in the market. Zinc draws better if warmed as well as lubricated.

In Fig. 243 are shown a pair of triple action dies, and in Figs. 244 and 245 a blank and a finished box lid made therein. The action of these is the same as in Fig. 231, except that the punch has relatively a longer stroke and carries the work down on to the embossing matrix M, which is fastened at the bottom of a special bolster, B, made with an opening at the back through which the work is removed, instead of dropping downward in the ordinary way. The object of this is to emboss panels, beads, lettering or other devices upon the bottom of the work, and yet not be obliged to knock it up through the die, which is difficult with cylindrical shaped articles. The removal spoken of is usually performed by gravity, the press being set in an inclined position, so that the work may freely slide out. Sometimes, however, an automatic push out is provided. This is safer, as gravity sometimes fails to do its duty at a critical moment. Presses built especially for such work usually have a shorter ram stroke than usual, as room is not required between the dies for knockout work, and a relatively longer plunger stoke is needed, so that the die L may be made unusually thick (to give it strength where it bridges across the open space in bolster), and yet that the punch may descend far enough to reach through it and downward to M. The punch itself is of course unusually long.

It is evident that other shapes (looked at in top view) than round may be treated by the drawing process. In Fig. 276 is shown a rectangular sardine box, whose sides are straight and corners rounded to about $\frac{3}{4}$ inch radius. This is quite difficult to draw, because the action upon the metal at the corners is approximately the same as in drawing a cylindrical box with the same radius, or $1\frac{1}{2}$ inches in diameter, which is very small considering the depth attained. There is in such case a violent flow of metal, modified somewhat as it extends outward from a rounded corner into the two adjacent straight sides. The shape of the blank for work of this kind is rather peculiar, the corners being very much cut away in comparison with the sides to allow for the great radial stretch of metal at those points. The turning up of the sides along near the middle thereof is obviously a bending action merely. In Fig. 260 is shown an oblong pan with rounded ends, which is of somewhat the same nature as the box just mentioned.

In Fig. 261 is shown a grocers' scoop, which was drawn in an irregular die, the flange and a part of the body being trimmed off afterward.

In Fig. 262 is shown an ordinary wash boiler bottom, illustrating a case where no special blank is purposely prepared, but where the so-called "well" or depression is drawn in an ordinary rectangular sheet of metal, the holding surfaces of the dies of course being large enough to cover it. This system is sometimes used in producing certain tin toys, where the two halves of an animal are thus drawn and trimmed and then soldered together along the spinal column, &c.; also for various other similar shallow work. Its advantage is that no cutting dies are needed except for trimming off a part or all of the flange after drawing, which dies would have to be furnished in any case.

In Fig. 263 is shown a pair of combination spring drawing dies, so called, with the blank they cut shown in Fig. 264, and other stages of the work shown in Figs. 265 and 266. In Fig. 267 is shown a pair of similar dies arranged to work from a pre cut blank, Fig. 268, and not supplied with cutting edges. The work is shown part way drawn in Fig. 269, and completed in Fig. 270.

Such dies are used in single action presses, the flange pressure being supplied by the drawing ring A, which is driven up and against die U by a powerful spring, S, working against a sliding plate, P, through the medium of a series of pins, B B. The stem D, together with its plate, P, nuts, N, spring, S, &c., form a portable device sometimes known as a "spring drawer," which can be screwed into any die adapted for it. Work done in this way is generally limited in depth to about 1 inch, as the pressure with anything much deeper would be so enormous as to waste a great deal of power, the descending ram having, of course, to compress the spring to the same number of pounds as are afterward given out by it upon its ascent.

Blank Dimensions.

In regard to the important matter of blank dimensions, I will again quote from my Franklin Institute lecture, as follows:

"It will naturally occur to the student of this subject that some easy tentative one. It is the surest, but in many cases the most expensive. It consists in cutting blanks of as near as possible the right size and shape by guess and trying them successively, modifying the shape of each to suit circumstances until the proper shape of drawn work is produced. For dies that do not cut this is not difficult, as the flat holding surfaces can be made plenty large enough, and whatever gauging arrangements are to guide the blank

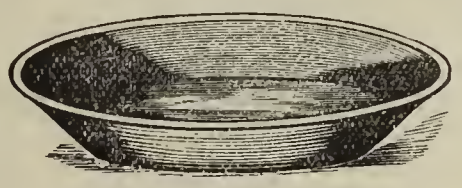


Fig. 255.

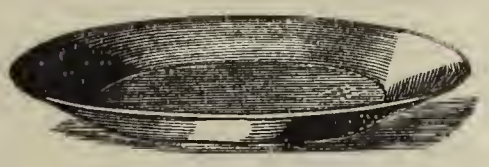


Fig. 256.

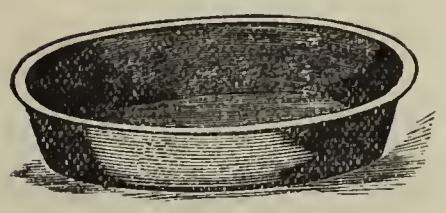


Fig. 257.



Fig. 258.



Fig. 259.

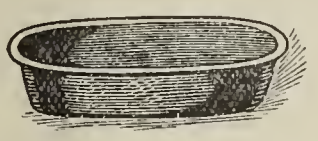


Fig. 260.

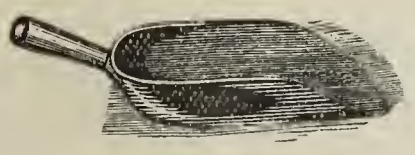


Fig. 261.

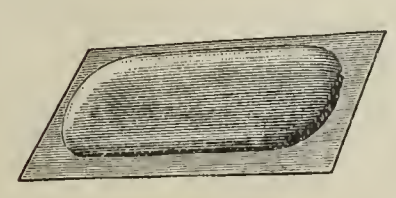
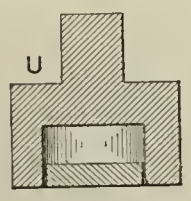


Fig. 262.



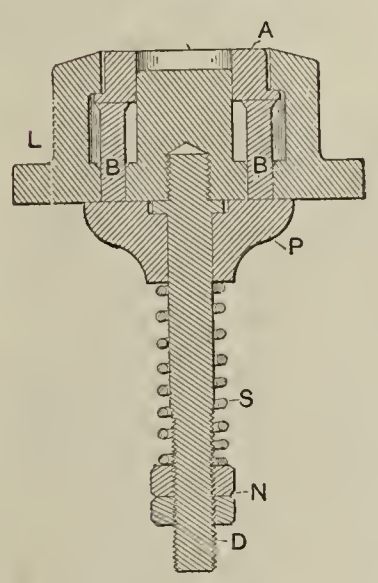


Fig. 263.

Fig. 264.



Fig. 265.

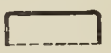
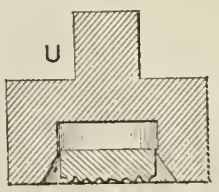


Fig. 266.



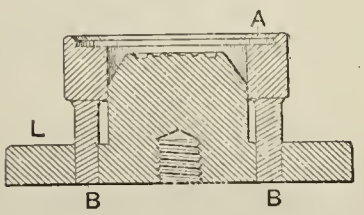


Fig. 267.

Fig. 268.

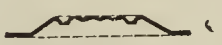


Fig. 269.

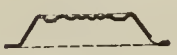


Fig. 270.



Fig. 276.

PRESS WORKING OF SHEET METALS.

method is desirable for determining the diameter of the blank for any given piece of drawn work, especially if its dies are to cut, as cutting edges are expensive to make—and to alter if guessed at and made wrong at first. Aside from lucky guessing, somewhat guided, perhaps, by analogies from other approximately similar work that dies have been made for before, I have in my own practice used three principal methods to obtain this measurement of blank diameter.

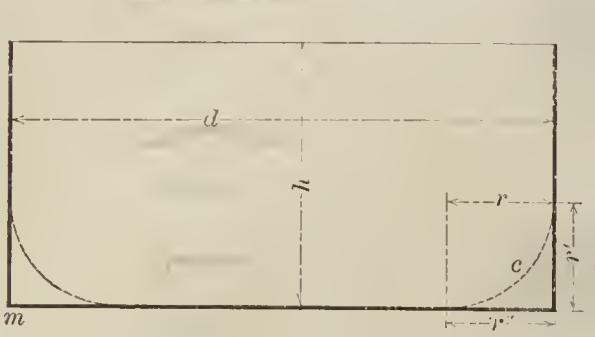
"The first of these methods is the can be put on afterward when its correct proportions are decided upon. In cutting dies, the female cutting ring must be made separately, and left unfinished until the size and shape is ascertained. The male cutting ring, which forms part of the upper holding surface, must of course be made, but can be left plenty large enough until this trial has been completed.

"The second method referred to may be called the 'gravitative.' It depends for its accuracy upon the principle that the thickness of the metal in a piece of

drawn work is the same as it was in the original blank, which is in fact usually the case. My own method is to carefully weigh the sample piece of drawn work which is to be reproduced, and then, knowing the weight of 1 square inch of a piece of similar sheet metal of exactly the same measured thickness, to calculate the number of square inches necessary in the blank and make its diameter to suit this given area. This method can obviously be practiced only where a sample of the work is at hand and where the blanks are circular in form. Certain inaccuracies may arise in the practice of this method, where there are sundry beads, corrugations, &c., near the center of the piece of drawn work, which tend to let the metal stretch when the punch comes home in the die. Such action is properly embossing, rather than drawing, and stretches the metal thinner in certain places, which, of course, invalidates the accuracy of this system. It is, however, often useful for work whose contour is simple in form near the central portions, where a drawing action does not take place.

"The third method spoken of may be called the 'mensurative.' This, too, depends upon equal areas and upon the thickness of the metal remaining the same. In the case of plain cylindrical work a very simple formula which I have worked out for the purpose may be used. This is given in diagram A, equation 3, for a box or cup whose corner at m is sharp or nearly so, and in equation 6 for a round cornered box. The latter formula is not theoretically accurate as regards equal areas, but serves an excellent practical purpose where the corner is not of too large a curvature—say with a radius not more than one-fourth the depth of the cup. The diagram given in diagram A is a vertical axial section of a cylindrical box or cup, the same as was shown in Fig. 235. It is not worth while here to give the working out of the formulæ, as by a close inspection the figures will explain themselves.

"In diagram B is shown a method which I have devised for ascertaining the area of a piece of drawn work of irregular contour as regards its vertical section. This method is a graphic one, an exact profile of the work being drawn to scale of real size and this contour line being laid off from its axis outward into sections, each exactly $\frac{1}{8}$ inch long. From the centers of these sections, at the points marked r', r'', r''', &c., horizontal measurements are taken to the axis. These measurements, of course, represent various radii of the piece of drawn work in question. If we let the sum of them be called s, we then get the very simple formula given in equation 3. The reason that just $\frac{1}{8}$ inch was taken for the length of these segments of the contour line was that it happened to reduce the equation to the simple form given, while any other length would have made it more complicated. The principle here involved is obviously that of the area of any zone, being its width multiplied by its circumference at a point representing the center of gravity of its single cross section. The points marked r', r'', &c., are, of course, not accurately in the center of gravity of each of the little segments, but they are practically near enough so. The same principle occurs in this method as in the last mentioned one regarding places in the metal which will stretch thinner when formed to shape, like deep beads or other indentations. This trouble may be mostly neutralized, however, by bridging over them, so to speak, in making the contour line—that is, by running the latter across from point to point of the corrugations instead of following their curves wherever it is judged that stretching will take place. This amended contour is shown at n, n, diagram B, by dotted lines, and on it the segments should be laid out.



Let (in inches):
d = diameter of cup.
h = hight of cup.
r = radius of corner.
c = arc of 90°, with radius r.
a = area bottom + sides.
a = area blank, also.
x = diameter blank is to be cut.

$$a = 0.785\,d^2 + \pi dh \quad \text{.....(1.)}$$

$$x = \sqrt{\frac{a}{0.785}} = \sqrt{\frac{0.785\,d^2 + \pi dh}{0.785}} \quad \text{.....(2.)}$$

$$x = \sqrt{d^2 + 4dh}, \text{ for sharp cornered cup} \quad \text{.....(3.)}$$

$$r' + r'' - c = \frac{r}{2} - \quad \text{.....(4.)}$$

$$2 = (r' + r'') - 2c = r - \quad \text{.....(5.)}$$

$x = \left(\sqrt{d^2 + 4dh}\right) - r$, about, for round cornered cup; with small corner, say where $r < \frac{h}{4}$ .....(6.)

Diagram A.

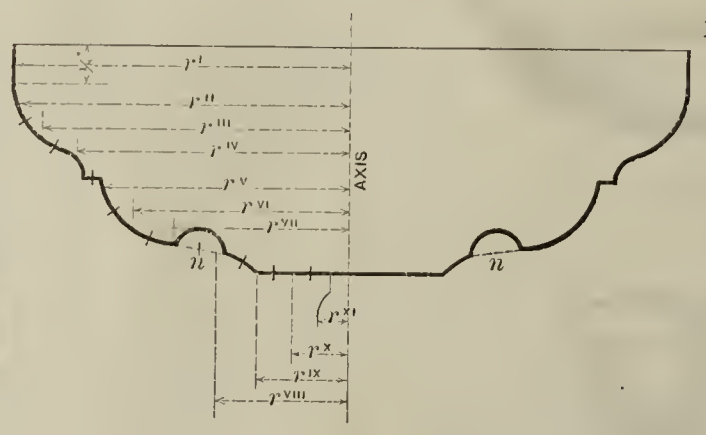
"In making drawn work whose top is elliptical instead of round, the formulæ above given may be used with some modifications.

"To do this, the ellipse is treated separately as regards its short and long axes, and values are inserted in the two equations which would be used for circles, which approximately coincide with the sides and ends of the ellipse at the termini of its respective axes.

"In making rectangular work with round corners, some idea of the shape of the blank may be obtained by treating the corners as belonging to a circle of the proper diameter, while the sides of the rectangle, which properly are not drawn at all, but only bent to shape, may be treated nearly by actual measurement, as in them very little stretching takes place. As regards the corners, however, the tentative method is the safest wherever it is possible to use it."

But few available data exist, or at any rate have been made public, regarding pressure per square inch necessary for holding the various kinds of metal between the surfaces of drawing dies. Neither do any proper testing instruments exist which will fill all the conditions present. These must be originated, and it is certainly very desirable that somebody should make a systematic series of experiments in connection with this matter, as well as in relation to the pressures in general that are used in sheet and bar metal work. Such experiments, if properly performed, are tedious and expensive, but the writer hopes at some future time to be able to publish something definite upon the subject. Some fragmentary experiments which he made a few years ago show about 200 pounds per square inch for holding the flange of a small milk pan, over 300 pounds upon a blacking box in one case and nearly 500 pounds in another. One such box, with less than $1\frac{1}{2}$ square inches of drawing surface, stood over 4000 pounds without the bottom being punched out, showing that in such shallow work there is often a great excess of flange strength. In general, for small tin plate work the pressure will probably run between 200 and 400 pounds.

The greatest possible plunger pressure that can be used in any given case without breakage is, of course, measurable by the tensile strength of the cross section of the work at the smallest diameter of the punch. This strength is obviously found by multiplying the circumference of the work at that point



Let (in inches):
r^{I}, r^{II}, r^{III}, r^{IV}, &c., = radii drawn to axis from centers of gravity of $\frac{1}{8}$-inch segments of contour line.
$s = r^{I} + r^{II} + r^{III} +$ r^{IV}, &c.; that is, the sum of the radii.
a = area bottom + sides.
a = area blank, also.
a^1 = area of one zone whose average radius is r_1, r^{II}, r^{III}, &c.
x = diameter blank is to be cut.

$$a' = 2\,r^{I}\,\pi\,\tfrac{1}{8} \quad \text{.....(1.)}$$

$$a = 2\,s\,\pi\,\tfrac{1}{8} = 0.785\,s \quad \text{.....(2.)}$$

$$x = \sqrt{\frac{a}{0.785}} = \sqrt{\frac{0.785s}{0.785}} = \sqrt{s} \quad \text{.....(3)}$$

Diagram B.

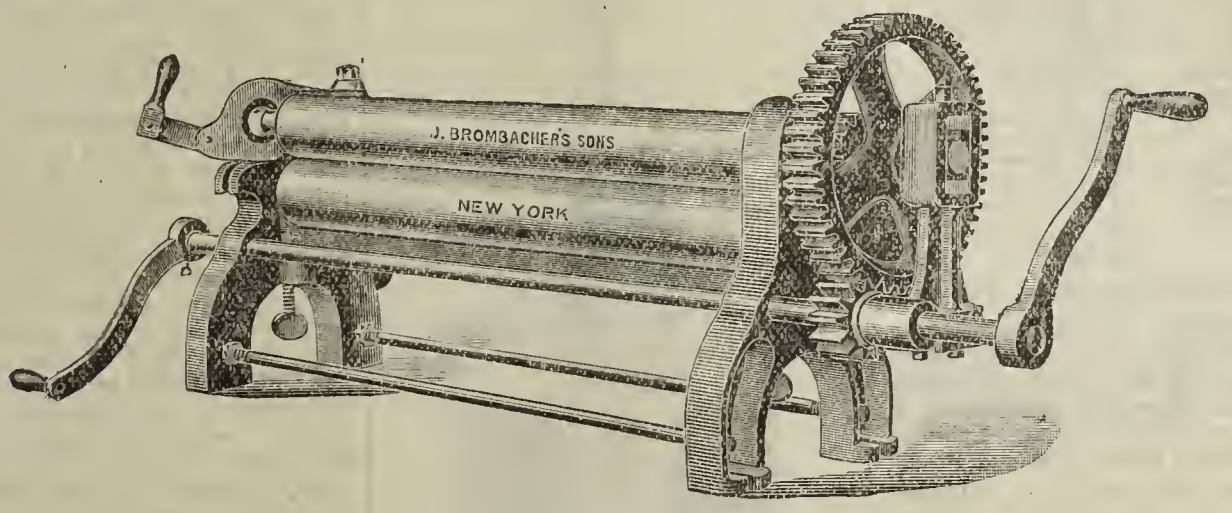
by the thickness of the metal and by its ultimate tensile strength per square inch. Or, P = SWT, our old formula with a new application.

In regard to the maximum limit of punch speed in drawing, we have again but few reliable data. The number of strokes per minute of drawing presses in commercial use vary from 10 to 200, with perhaps a rough general average of 50 or 60 per minute. At these rates the various metals used seem to flow properly without tearing fracture, although it may be that in some cases a slower speed would produce better results. Here, again, some systematic experiments are very desirable.

In regard to the kinds of presses used for such work, the general motion required has been before described. The plunger motion is almost always produced by means of a crank and pitman. The ram motion also is sometimes obtained this way in the case of certain kinds of shallow work, especially in brass factories. The dwell for the purpose of holding the flange of the work is obviously in such case but an approximate one, but if the metal is not too thin it seems to answer the purpose in the cases referred to. The majority of drawing presses are arranged to work the ram during its downward stroke by means of cams. These, if properly made with enormously strong shafts and rollers, with amply large bearing surfaces and of proper material, are very efficient and durable. The lifting of the ram is sometimes positively done by cams, and sometimes by non positive devices, such as springs and weights, or steam, air and water pistons, working in appropriate cylinders, &c. Any of these devices, if properly designed and adapted to the speed of the press, are sufficiently good for the purpose. In cases where the ram carrying the upper die (or blank holder, as it is often termed) is reversed, doing its clamping in an upward instead of a downward direction (as is the case in some large bottom slide presses), the direct action of gravity is used to return it. This gives excellent results, and an exceedingly simple construction can be obtained. Another device which has come into rather extensive use consists essentially of a system of toggle joints intervening the ram and the press frame, which hold the ram securely clamped, with its die against the flange of the work, without bringing a running pressure upon the shaft and roller bearings, as is the case with cam presses. This is obviously an advantage, but there is considerable difference of opinion among press makers and users as to whether any such advantage compensates for the additional complication required, especially after several years' wear has taken place. In general it may be said that any of the plans mentioned are practically good enough if properly designed.

Improved Slip Roll Pipe Former.

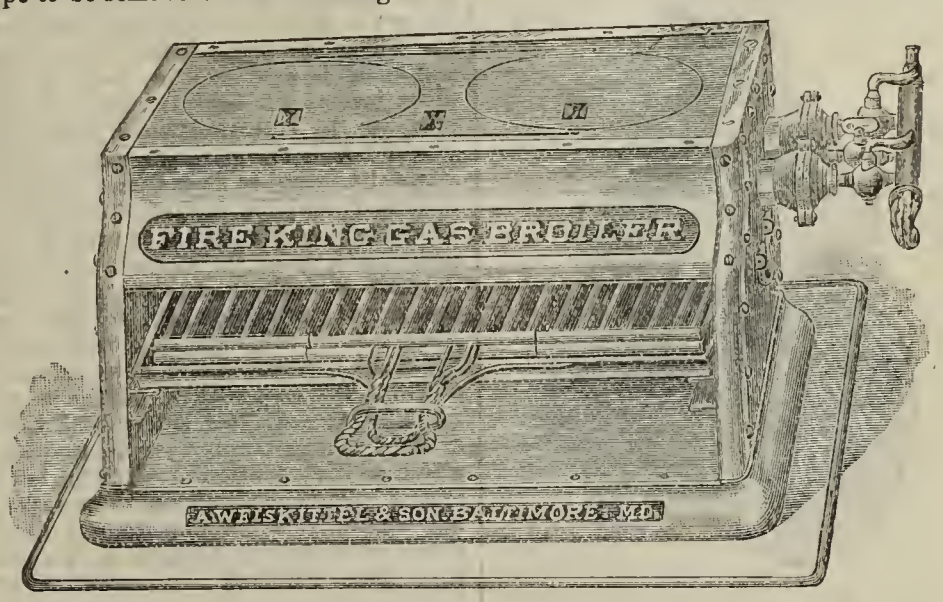
Jacob Brombacher's Sons, 30 Cliff street, New York, are bringing out an improved pipe former as here shown. The superior merits of this machine are pointed out by the manufacturers as follows: The upper or slip roll rests at the geared end in two fixed bearings, making it less springy than if hung on a screw. The other end of the slip roll is supported by a solid box, instead of an upper half box, thereby relieving the other two bearings of much undue strain. The slip roll bearing is removed from the shaft by sliding it sideways instead of swinging it upward, while the mechanism is so arranged that it at the same time lowers the under roll in order to allow the formed pipe to be removed. An advantage referred to is that this construction allows the workman to remain at one end of the former, instead of going to the other side, to lift the slip roll by means of a screw. The pinion shaft runs through both side frames and has a crank on each end, thus increasing the power. This machine can be supplied in sizes ranging from 3 to 4½ inches diameter of rolls, the length of which may be anything up to 60 inches. The machines are geared 4 to 1, and are capable of rolling up No. 12 gauge iron. They can be furnished for either hand or power.



Improved Slip Roll Pipe Former, Hand or Power.

An Improved Gas Broiler.

We present in the accompanying illustration a general view of an improved gas broiler which is being offered the trade under the name Fire King by A. Weiskittel & Son of Baltimore, Md. This broiler is of a size suitable for family use, being provided with two cooking holes on top, so that boiling and broiling may be done at the same time with the same burner. The manufacturers call attention to the fact that as the broiling is done beneath the flame the juices of the meat cannot drop into the fire and that the broiling is done quickly and uniformly. The claim is also made that meat cooked with the Fire King gas broiler retains all its juices and is more palatable than when broiled in the ordinary way. The sides, bottom and back of the broiler are made of heavy sheet steel, and the frames, base, &c., are highly polished. The broiler is 20 inches wide and 14 inches deep at the base, and measures 10¾ inches in hight. A wire broiler, 12 x 15 inches, and a drip pan accompany each broiler.



An Improved Gas Broiler.

The first American vessel to pass through the Manchester Ship Canal was the "Ambrose," with a cargo of oil from Philadelphia.

The gold coinage executed at the Philadelphia mint in the fiscal year ending June 30 will, it is said, be by far the heaviest in the history of that institution, approximating $80,000,000. The largest previous record was in 1861, when the gold coinage was $67,588,000.

PLUMBING and GAS FITTING.

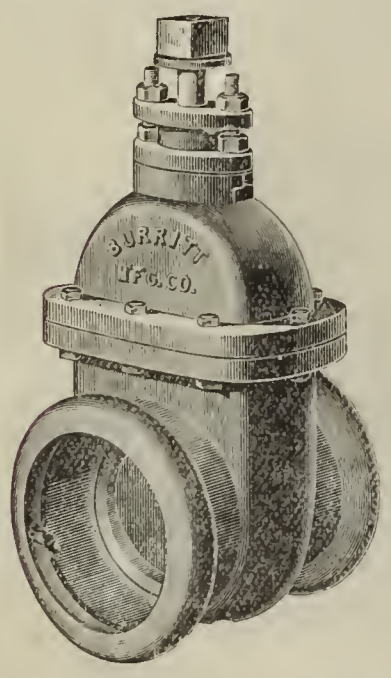
Plumbers' Convention Delegates.

The following delegates were elected to attend the national convention at the annual meeting of the Association of Master Plumbers of Brooklyn, N. Y.:

E. Heyward.	Wm. J. Gault.
Geo. Cummings.	Thos. H. Radcliffe.
Martin Fallon.	Walter Coyne.
R. J. Knox.	P. M. Moffatt.
G. B. Lewis.	C. F. Mentzinger.
J. W. Kelly.	Thos. Kelly.
Willis Gardner.	C. W. Evans.
J. J. Keenan.	B. McBride.
Wm. Eiermann.	H. M. Noble.
Jos. Zoll.	J. Quatlander.
O. O. Sawkins.	M. F. Gleason.
E. Macdonald.	Louis Haaf.
G. W. Smythe.	John H. Read.
Geo. Meng.	G. A. Smith.

Roller Wedge Gate Valve.

The illustrations shown herewith present a new gate valve recently put on the market by the Burritt Mfg. Company of the Havemeyer Building, 26 Cortlandt street, New York. The company have large works at Bound Brook, N. J., where these goods are manufactured. Fig. 1 shows the valve complete and Fig. 2 is a sectional view. The valve is the invention of O. W. Burritt, who for a number of years was superintendent of the Water Works Department of the city of Newark, N. J., and was devised as the result of the stems of the gate valves used on the city system frequently breaking in the endeavor to open or close the valves. The valve consists of two disks operating in connection with an expansion wedge, securing a free and anti-friction movement by means of non-corrosive balls moving in inclined recesses between the wedge and disks. As the disks in common with the wedge move downward, the wedge is stopped by lugs cast in the shell, while the disks travel on and expand to a perfect shut off, it is said, regardless of sand or sediment collected in the bottom of the shell. In opening the gate the balls moving in the inclined recesses cause the wedge to yield at once on the motion of the screw, and the disks relieved of all forward pressure respond to the touch of the wrench. The shell of the valve is made with a smooth face for the disks to shut against, and the disks are made with a babbitt metal face or brass face, according to the use to which they are put. For gas the valves are made with a brass stem, and brass is used on the faces of the disks instead of babbitt metal, which prevents the corrosion which otherwise would fasten the parts together. For steam the valve has a peculiar advantage in that it may be packed at the stem when the valve is open, as the top of the socket into which the screw is fastened is made conical and a recess is made in the top of the valve shell, so that the space around the stem is closed while the collar is removed and new packing put in. The ease with which the valve may be opened after it has been shut as tight as possible is a feature that has attracted the attention of all who have seen it. A large number of these valves have been sold to the Niagara Construction Company, Niagara, N. Y., and they have attracted the attention of water works engineers in cities where particularly heavy pressures are carried. The valves are now made in sizes from 2 to 12 inches and later will be made in all regular sizes up to 48 inches.



Roller Wedge Gate Valve.—Fig. 1.—Showing Valve Complete.

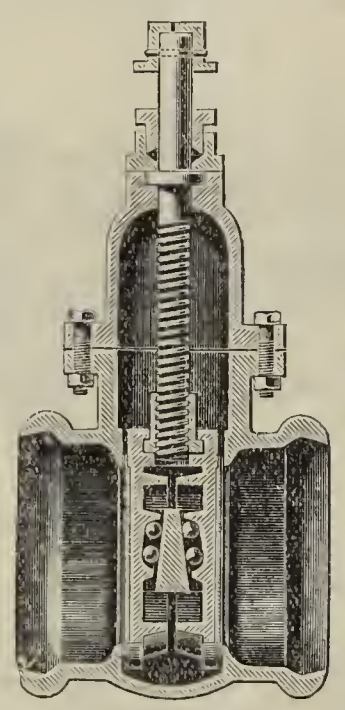


Fig. 2.—Sectional View.

Smith & Webster.

About two years since, in the belief that there was room for another plumbers' supply house, the firm of Smith & Webster was formed in Chicago. The members of the new firm, Edward C. Smith and William M. Webster, both had a practical knowledge of the business, with years of experience in both manufacturing and selling plumbers' supplies. They started in a modest way, but met with encouraging success and added one department after another until it became necessary to secure larger quarters and acquire much greater manufacturing facilities. For this purpose they recently secured the building extending from 15 to 21 North Clinton street, Chicago, in which they concentrated their manufacturing and sales departments. They have pushed the work of equipping the factory as rapidly as possible, but still have important projects in hand which are in process of completion. The firm are highly gratified with the manner in which their enterprise is being recognized by the plumbers, whose patronage is steadily increasing and keeping pace with the improved facilities now enjoyed.

The building occupied is four stories in hight, with a fine basement. It originally consisted of a front and back building, separated by an area or court. This court is now inclosed and occupied by a two-story structure, of which the second story is used for office purposes, to which it is admirably suited. Side windows and skylights pour a flood of light into it, while from it all parts of the storeroom in front and the shipping room in the rear are visible. The storeroom and shipping room occupy the whole of the first floor. The storeroom is conveniently arranged with racks running transversely across the room, with a passage way down one side for customers. The shipping room in the rear opens on a roomy alley, and is also fitted with racks in which small wares are kept that are in greatest demand. The basement is used for the storage of pipe and fittings, bathtubs and other bulky or weighty goods. Machinery is about to be installed here for the manufacture of copper lined bathtubs. A portion of the basement is used for an engine room, in which is a 250 horse-power Reynolds Corliss engine, driving the machinery of the entire establishment. Near it is a dynamo, used for electric lighting and to supply current for the plating department.

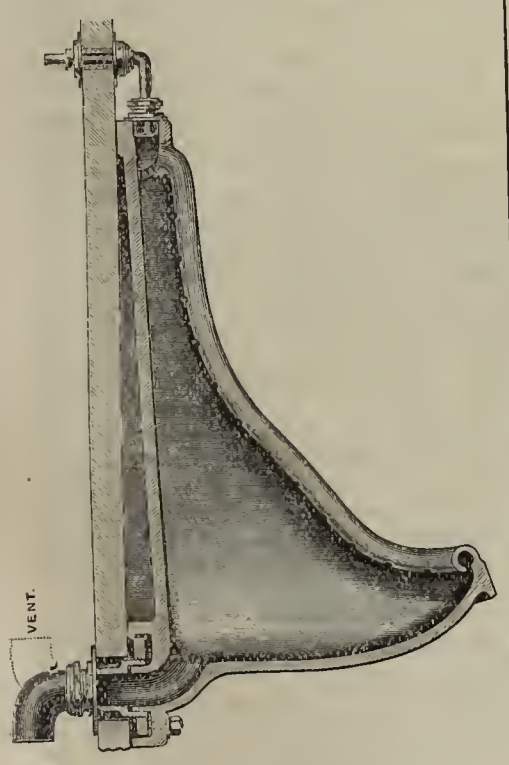
On the second and higher floors are the several manufacturing departments. One of these is the marble room, in which marble slabs imported direct from Italy are cut, shaped and polished for all purposes in connection with plumbing. Machinery plays an important part in this work. The most notable machine now in use here is Riehlé Bros.' countersinking machine. A pneumatic cutting machine for decorative work is now being added, and steam polishers are shortly to be introduced. In connection with the marble room is the department for manufacturing laundry tubs, which is fitted up with appliances for making tubs of slate, soapstone and granite. In the cabinet shop the firm make all their own wood work, such as rims for bathtubs, closet tanks, closet seats, &c. The lumber is bought in the rough and the goods are turned out complete, even the tanks being lined on the premises. A brass foundry is on the top floor, which is fitted with a brick pavement and otherwise rendered fire-

proof. Three furnaces are regularly run and capacity is afforded for three more. The firm thus turn out all their own brass castings and in an adjoining room finish them up on lathes and special machines, including polishers and buffers. Everything is carefully tested before it goes into stock to insure good work. Tables of the water pressure in all cities and towns are kept for constant reference, and whenever goods are ordered for points having very high pressure they are made accordingly and tested to withstand much greater strain. An extensive plating room is an adjunct of the brass foundry, in which plating is done in nickel, silver and copper. A well equipped forge and tool room enables repairs to be promptly made to machinery, tools to be quickly sharpened, and much machine work to be turned out exactly suited to the special requirements of the business. Two elevators are in constant service, one in front and the other in the rear of the factory.

The location selected is admirably suited to the business transacted by this firm. They are in the immediate vicinity of the lead pipe manufacturers and other makers of plumbers' supplies, close to railroad depots and warehouses, in the heart of the city and yet in a manufacturing district. They are thus near their city customers, near their base of supplies, and well situated for the out of town trade at the same time. They are jobbers as well as manufacturers and are thus prepared to furnish anything needed by a plumber.

Perfecto Urinal.

The illustration presented herewith shows the Perfecto urinal which is being put on the market by Fred Adee &



Perfecto Urinal.

Co., 90 Beekman street, New York. It is made of vitreous ware, which it is said will not craze, the material being of the same character all the way through and non-absorbent. It is said that this ware will stand the sudden heating and cooling with the contraction and expansion to which a urinal is subjected without crazing. The back of the urinal is inclined to facilitate the wash, and the flushing rim so arranged that all parts of the bowl are thoroughly scoured. The back is ground flat so as to fit close to the slab to which it is attached. The top connection is made by means of a flexible rubber union which provides for expansion and contraction. The waste outlet at the bottom is so arranged that all the pipe can be attached to the slab and the urinal connected at the last moment, and may be readily removed in case it is necessary to do so for repairs.

A Growing Dubuque Enterprise.

One of the busiest foundries in the city, says the Dubuque (Iowa) *Times*, and where from 90 to 100 skilled laborers are constantly employed, is the Excelsior Brass Works, whose goods are handled by all the leading jobbers of the country and the business of which has increased to such a msgnitude that it can be justly rated as one of the leading industries. The gentlemen at the head of this business are all well-known citizens, and the new life and energy infused in the business but reflect their aggressive methods. The officers of the company are: President, A. W. Hosford; vice-president, A. E. Kemler; secretary and treasurer, J. W. Waters; general manager, P. R. Martin. These gentlemen, together with P. H. Halpin, comprise the board of directors.

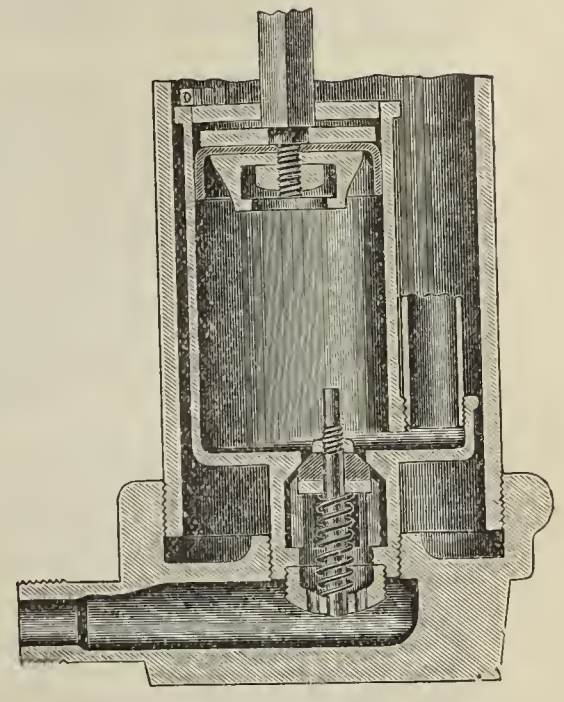
This company were incorporated in 1892 and in a manner succeeded to the business of Hodge & Waters, who had been in the business for some years, and with renewed capital and an infusion of new blood have enlarged the business and adopted new specialties, making their lines now complete and attractive. They manufacture a full line of plumbers' and steam fitters' supplies and make a specialty of brass castings and nickel plated goods.

Despite the fact that this company are comparatively young, the quality of their product has given them an enviable reputation wherever the goods have been sold. They keep in their employ three traveling salesmen who only look after the jobbing trade, and a first-class demand for their goods has been created in nearly all parts of the country. It may seem strange to be told that a Dubuque factory with but two years' opportunity to build has already secured a clientage that extends from the Atlantic to the Pacific, but such is the case with the Excelsior Brass Works, and their trade is reaching proportions which are highly gratifying to the management.

An innovation has been made at this factory which is at least novel and which frees it from the fear of coal strikes and permits a saving of a large amount in fuel alone. It is the only factory in Dubuque using crude oil for fuel and it is also used for foundry purposes. The manager reports that this substitute for coal works more than satisfactorily.

Type C Non-Wasting Hydrant

The cut presented herewith shows the principle and operating mechanism of the Type C Non Wasting hydrant made by the Ette & Henger Mfg. Company, St. Louis, Mo. The valve closes with the pressure as shown. It is not hung to the grating rod and is, it is claimed, perfectly reliable even without the spring. When the hydrant is closed the valve rod is raised 4 inches above the valve by weight and pressure, and raises the 2½-inch pump cup washer in waste chamber, which permits all the water in the hydrant to enter this chamber, and in opening the hydrant this water is forced back into the supply pipe before opening the supply valve. The waste chamber has an area of double the waste water. The advantages of this hydrant which are alluded to are that, in addition to saving water, it overcomes the annoyance of having water ooze out of the ground



Type C Non-Wasting Hydrant.

in yard, lawn or cellar, to freeze in winter and make mud in summer. There is no chance, furthermore, for the gases of the earth entering the valve at the waste hole and impregnating the water.

TRAPS AND VENTS.

JOHN FORD, 62 West Broadway, New York, makes a specialty of the plumbing repair business in the downtown section of the city, and does quite a large contracting business in the uptown residence section.

GEORGE E. THOMPSON, formerly of Providence, R. I., has purchased the business of the Newtonville Heating & Plumbing Company, Newtonville, Mass., and will continue the contracts of the same.

THE DAVIS & STEVENS MFG. COMPANY, Seneca Falls, N. Y., issue circulars and advertising matter relating to some of the specialties of their manufacture. One is a card illustrating and giving the chief features of the Tornado air pump for drawing beer or other liquids under air pressure, filling tanks and inflating pneumatic tires or for any other purpose. A second similarly describes the Cyclone pump, especially adapted for inflating pneumatic tires. Another circular is devoted to pump leathers, of which they manufacture all sorts, as well as washers for hydraulic and sanitary pumps. Cuts are shown of some of these articles and description given.

ELDRETH ARNOLD, an Auburn, Maine, plumber, is moving into the basement of Goff Block, at Lewiston, Maine.

THE NEW BOARD OF PLUMBING EXAMINERS of Holyoke, Mass., met and organized last week with Dr. G. H. Smith, chairman of the board of health, as chairman. The other members of the board are City Engineer Walther as building inspector and Dennis O'Leary,

a plumber. Joseph Murray, inspector of plumbing, is to be secretary of the board. Notices of the formation of the board and of the State law regarding registration and securing licenses will be sent to the plumbers, and applications must be filed on or before June 15. The law requires all journeymen and master plumbers who were not engaged in the business before June 10, 1893, to pass an examination before local boards before they can be allowed to do any work under a license.

THROUGH the courtesy of Eli Wardell, plumbing inspector of the city of Taunton, Mass., we are in receipt of a copy of the ordinances for the regulation of plumbing in that city.

S. G. DUNBAR of West Medfield, Mass., has purchased the interest of C. N. Black in the plumbing business at Belfast, Maine. The new firm will be Mitchell & Dunbar, and Mr. Dunbar being experienced in steam heating, it will be made a new feature of their business.

FRANK I. LESSARD & Co., the McGregorville plumbing firm, have opened a sample room at 1268 Elm street, Manchester, N. H., which contains a full line of plumbing specialties, stoves, ranges and furnaces.

BENJAMIN C. SMITH, 275 Pearl street, New York, who introduced the French Pipe Cutting Machine 18 months ago, for cutting off sections of water mains and smaller sizes of pipe, reports a very satisfactory business in this tool. In addition to having been adopted by a number of water companies in America, orders have been received from Christiania, Norway; Santos, Brazil; Bombay, India; Mexico, &c. This implement, described at length in these columns at the time of its introduction, makes a clean cut on wrought or cast iron pipe in a few minutes with two men, saving the remaining portion of the pipe, heretofore ruined in smashing out, not to mention the avoidance of leaks often started 100 or 200 feet away from shock.

JOHN PIERCE, JR., 43 Beekman street, New York, representative of the William S. Cooper Brass Works, is showing one of their new aluminum sinks. The sink weighs about 10 pounds, is 14 x 22 inches in size and 6 inches deep. It is provided with one of their patent detachable overflow wastes. The overflow stands 4¼ inches high and fits tightly into the sink outlet by means of a special rubber band. When not in use the waste hangs in a fork placed in an offset in the sink out of the way. The sink is as smooth and bright in appearance as a piece of polished silver.

THE NEWARK BRASS COMPANY, 164 166 First street, Jersey City, N.J., make a specialty of brass work for plumbers.

E. ASPINALL, 98–100 Beekman street, New York, has recently enlarged and rearranged his sample room. With a fresh coat of paint and a fine line of imported sanitary earthenware, it presents many attractions to the plumber. His porcelain baths are one of his special features. White porcelain lavatories, with splash boards, soap cup and sponge holder in a variety of styles and sizes, make a handsome line of plumbing fixtures. He is showing a variety of styles of the Unitas water closet, one of which is furnished with a rim, making it convenient when used as a slop sink. Another one of his specialties is Aspinall's enamel for bathtubs. This is used on copper lined bathtubs after the tinning has worn off. It effectually prevents corrosion and is not affected by change of temperature.

W. F. MCCARTHY, formerly with the Kewanee Boiler Company, has accepted the position of traveling salesman with the J. L Mott Iron Works, 311 and 313 Wabash avenue, Chicago.

H. L. SMITH, Southbridge, Mass., plumber, is to remove from the Dresser House Block to the store now occupied by C. H. Ullrich, Elm street.

ROBERT MAITLAND, Clinton, Mass., plumber, has removed his business to 91 High street, under the American House.

CHARLES DESARMO is making arrangements to open a new plumbing establishment at Chillicothe, Ohio.

ALLIE HOOD of East Lempster bought the stock in trade of F. A. Clarke, Charleston, N. H. Mr. Hood is a practical plumber, having served a long apprenticeship to the trade and finishing in the New York school of trade. He will continue the business at Mr. Clarke's old stand in the Hoyt Building.

IN TRENTON, N. J., last week, Chancellor McGill dismissed a suit brought by local pottery firms to break the Sanitary Pottery Trust, known as the Trenton Potteries Company.

The Chicago Master Plumbers.

The Chicago Master Plumbers held their regular meeting at 197 East Madison street Monday evening, May 28. The following officers and members of the association were elected delegates to attend the convention of the Illinois Master Plumbers' Association, to be held at Peoria Thursday, June 7:

Paul Redieske, president.
Thos. Conway, vice-president.
Alex. W. Murray, financial and recording secretary.
P. Sanders, treasurer.
G. A. Larson, sergeant-at-arms.
T. P. Culloton, P. M. Murphy, C. C. Breyer, J. R. Brecn, D. M. Quay, M. J. Carboy, } Members of Executive Committee.

The Apprenticeship Question.

The following extracts are taken from an interesting paper prepared by Jos. Shearlock of New Haven for the Connecticut State Association of Master Plumbers for their convention held at Hartford, Conn., February 15:

I have chosen three general heads under which to discuss this matter—viz.: 1. Is an apprenticeship system necessary? 2. Apprenticeship from the standpoint of the master plumber and the boy. 3. Will the end justify the means? To the first question, Is an apprenticeship necessary? I answer yes, and will give my reasons therefor. Labor saving machinery has not played a very important part in the plumbing trade, except in the manufacture of traps and some other minor detail. The hand work of the craft is now as it was 30 years ago, but the skillful plumber of to day must think as well as work, for the work done years ago, good as some of it undoubtedly was, must now be duplicated in all that is good and done with a clear understanding of sanitary methods that have come into existence within the last 15 years. That better work is being done now than ever before is due largely to the writing of plumbing specifications by experts in sanitary work, the requirements of which would be a revelation to some of the old time plumbers who have long since passed to their reward.

The plumber of to-day must be able to do more and must know more than is absolutely necessary in doing an ordinary day's work; he must know something about the general principles of hydraulics, the physics of gases, the circulation of water by the application of heat, &c., and must be prepared to answer offhand any question that a prospective customer or an inquisitive questioner may present.

In the midst of all these changes how fares it with the journeymen plumber—has he kept pace with the march of improvement or has he fallen behind in the race? First class work requires the services of first class workmen in its erection, but how many men have you in your employ that can be used on the best work, and how did these men attain the skill that enables them to do better work than the majority of our employees? The journeyman plumber who has the ability to erect first-class work in a neat, substantial and satisfactory manner is nine times out of ten well along in the thirties and one who has been in constant practice from his nineteenth or twentieth year up to date. From this I draw the conclusion that constant practice and some study are absolutely necessary to the development of the really first-class workman. It is true that many of the best have reached perfection in the art without the aid of apprenticeship indentures, but what we want is more men who are able to do the best work, and this I think we can obtain only through the systematic and thorough methods that can be enforced by a well regulated apprenticeship system. Is it not true that fully 90 per cent. of all the journeymen plumbers have learned what they know about their every day work as follows?

A boy has reached the age of 18 years, when it becomes necessary that he must support himself and acquire the ability to earn his own living. His father or perhaps his mother has an idea that plumbing is a good trade for the boy to learn. If he finds a master plumber in need of more help a bargain will be struck and the boy set at work. All this is done with a present purpose only, and no ultimate result is aimed at. The boy will continue to work along until the master plumber has no further immediate use for him, and when that time arrives he is dropped to seek work elsewhere. By this time he is 20 years old perhaps, and still without the rudiments of his trade. He has a smattering, however, of the way work is ordinarily done, though he has obtained but little knowledge of how it ought to be done. He secures employment with another master plumber, to be again dropped when convenient for the employer to do so. By this time he is 21, has attained his majority, and if he has anything in him will see plainly that something must be done. He puts on a bold front and asks for work as a journeyman, well knowing that his ability will not warrant his employment as such, but being equally sure that in no other way can he obtain that practice he knows is essential to enable him to do good work. You all know how long he will work for you as a journeyman. Perhaps long enough to permanently injure your reputation for doing first-class work, perhaps not so long, but the result is the same, another discharge, followed by another and still

another attempt by the young man, until he has obtained that practice which will enable him to take his place among the rank and file of ordinary journeymen. . . .

If we are to take an apprentice let him be 16 years old. The first year of life in the shop will be largely taken up in learning the names of the tools, running errands, &c.; his time being worth but little we can pay him but little. The second year he will be well acquainted with details and ought to make a good helper; he is therefore worth more and you can therefore pay him higher wages. During the third year you will or should expect him to handle the tools himself, and toward the end of it he should be expected to do simple jobs under the eye of the employer or journeymen. The fourth year he should be in actual work on the building; he will make mistakes—we do—but he must be encouraged to learn in every way that is possible, and by the end of the fourth year should be able to do rough work, gas fitting, &c., in a satisfactory manner. The fifth and last year he should take part in the best work; it is almost certain that he will not have the necessary ability to do such work, but he should be encouraged to do his best. During the last three years he should receive wages in proportion to his ability. I would not recommend any arbitrary rate of wages. Pay every boy as you would every man—what he is worth.

The second thought—viz., apprenticeship from the standpoint of master and boy. Speaking to the master first, I would suggest that if you have any idea of taking an apprentice, ask and answer the following question: Do I want an apprentice or do I want a boy? Here is a distinction with a difference. To take an apprentice means there will be with you for five years a youth fast growing into manhood. During that five years his future will be to a great extent molded for good or evil. You are to see to it that he has opportunities to learn that which shall be in the future his sole means of support. Are you willing to take upon yourself this responsibility? If you are, let me advise you. Do you know anything about the boy. If not, find out something. Who are his parents? Are they willing to do what they can to encourage him to learn a trade and to co operate with you in your endeavor to make him a good workman and citizen? Now look the boy over as carefully as you would if you were about to hire a journeyman, or more carefully. Your experience with workmen will tell you if he has got the general make up necessary for the development of a good workman. If you are not perfectly satisfied in every way do not take him, but don't make him a drudge. Treat him as one with whom you have made an important contract, and carry out your part of it, no matter what the consequence may be.

Erastus Stebbins.

Erastus Stebbins, a well-known inventor of Chicopee, Mass., died suddenly on May 22. Mr. Stebbins was born in Winchester, N. H., in 1817 and went to Cabotville when about 25 years old. He began work in 1838 with the Ames Mfg. Company, Springfield, as a machinist, and then opened a small shop of his own just back of the factory, where he began the manufacture of faucets, water and molasses gates, &c. During the war his business was carried on where the Ames Sword Company's factory stands, and later it was moved to Taylor street, Springfield, until it was sold out about five years ago. It is now a prosperous institution at Brightwood. Since his retirement from business he devoted himself to the care of his large real estate interests. Mr. Stebbins was prominent in town affairs, having been a Selectman in 1871 and a representative in the Legislature twice. He was also an organizer and director of the First National Bank of Chicopee and had been a trustee of the savings bank for several years. He was an original charter member of the St. John's Lodge of Odd Fellows when it began in 1847 and had been connected with the body ever since. He was also a prominent member of the Chicopee Lodge of Masons. Mr. Stebbins married Elizabeth A. Dudley 50 years ago and besides the widow leaves four sons.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

JOHN P. SCHAFFER, 18 Wood street, Pittsburgh, Pa., manufacturer of Novelty ventilated wall pipe and specialist in hot air, hot water and steam heating, has recently completed a hot water plant for the new residence of J. L. Scott, Edwin street, Pittsburgh, Pa., and has about completed a similar plant for three large flats just erected by Fuhrer & Sons, on Butler street, in that city. Mr. Schaffer has also received the contract for the heating and ventilating of the new public school building at Avalon, Pa., which will require some 40 radiators, and has the contract for the hot water heating for the new residence of James Booth, on Boquet street, East End, Pittsburgh, which will require some 20 radiators. In all of the above work the Novelty hot water circulator has been used. In the heating of residences and buildings with hot air Mr. Schaffer has just completed the installation of plants in the residences of John Fite, Fred. Sauer and Henry Avermann, all in the East End, Pittsburgh, and also in the new building of Leak & Green, Shields Station, P., F. W. & C. Ry. He has also received contracts for heating with hot air the new public school building in the Fourteenth Ward, Allegheny, Pa., and the residences of A. W. Vanata, Greenfield, Pa.; Geo. Schaffer, East End, Pittsburgh; S. C. Beeson, McKees Rocks, Pa., and A. J. Demmler, at Demmler, Pa. In all of the above work the Novelty ventilated wall pipe is being used exclusively. Mr. Schaffer reports considerable new work in prospect, which naturally makes the outlook for the future very encouraging.

SEALED PROPOSALS will be received by the Board of Trustees for the Improvement of the Court House, at their office in Canton, Ohio, until Tuesday, June 5, for the sewerage, plumbing and gas fitting of the entire court house.

SHACKELFORD & GENTRY of Richmond, Ky., have been awarded the contract for heating the new school building about to be erected in that city, the price obtained being $1200. They will use the Triumph King furnace, manufactured by the Craig-Reynolds Foundry Company of Dayton, Ohio.

GODLEY & MORRIS have the contract for an extensive job of plumbing for August Straus, at his residence on Forest street, Oberlin, Ill.

THE BOARD OF EDUCATION of Newark, N. J., have awarded the plumbing and repairing contract for the coming year to the Edward Dunn Company.

AMONG the contracts recently taken for steam heating by Kehm & Mertz, 289 Kinzie street, Chicago, can be mentioned the following: Women's Memorial Chapel, Penn and Veddar streets; 16-room school building, Washburne avenue and Robey street; residence of J. T. Quinn, Oakdale and Lake View avenues.

DAVID HORN of York, Pa., has secured a contract for warming and ventilating a 12-room school building in that town, and will use four Economy combination steam and air heaters. The plant is to be installed after plans prepared by the J. F. Pease Furnace Company.

THE MORGAN STEAM HEATING COMPANY of Cleveland, Ohio, have the contract for heating the new residence and office of Dr. Hobson on Prospect street with a hot water plant, and will use a battery of two Economy hot water heaters, No. 118.

SEALED BIDS will be received by F. P. Dixon, chairman of the Board of Education at St. Charles, Minn., until June 11, to furnish with heating apparatus the annex to the present school house.

COOK & CHICK, 253 and 255 Kinzie street, Chicago, are to overhaul the steam fitting in the flat building of L. D. Hammond, Ellis avenue and Forty-third street. They will also install a hot water heating plant in the residence of Edward Lister, 23 Greenwood avenue.

SULLIVAN & HAYNES, Jefferson, N. Y., have been awarded the contract to place the new heaters in the County House. Their bid was $1166.50.

THE CONTRACT for plumbing and steam heating the new court house building at Snow Hill, Md., has been awarded to Harry A. Miller of Wilmington, Del.

THE BRIDGEPORT STEAM HEATING COMPANY, Bridgeport, Conn., have secured the contract for placing a steam heating apparatus in the new office building of the Bridgeport Copper Company.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, have the contract for hot water heating in the residence of H. R. Wilson, 4332 Grand Boulevard.

PHILIP F. CONROY, Newport, R. I., has been awarded the contract for heating the new Industrial School in that city. His bid was $1487.

WM. H. LINCOLN, chairman of Selectmen, Brookline, Mass., will receive bids till June 11 for the heating and for the plumbing of the new High School building at Brookline.

SEALED BIDS will be received by J. J. McIntire, Osceola, Iowa, up to June 5, for the construction and erection of steam heating apparatus in the two-story High School building about to be erected in the independent school district of Osceola, Clarke County, Iowa.

E. BAGGOT, 169 and 171 Adams street, Chicago, has the contract for plumbing and gas fitting in the residence of J. W. Stevens, Grand Boulevard, near Forty-second street.

The Klatte method of rolling weldless chain has been introduced at the Germania Works, Neuwied, Germany.

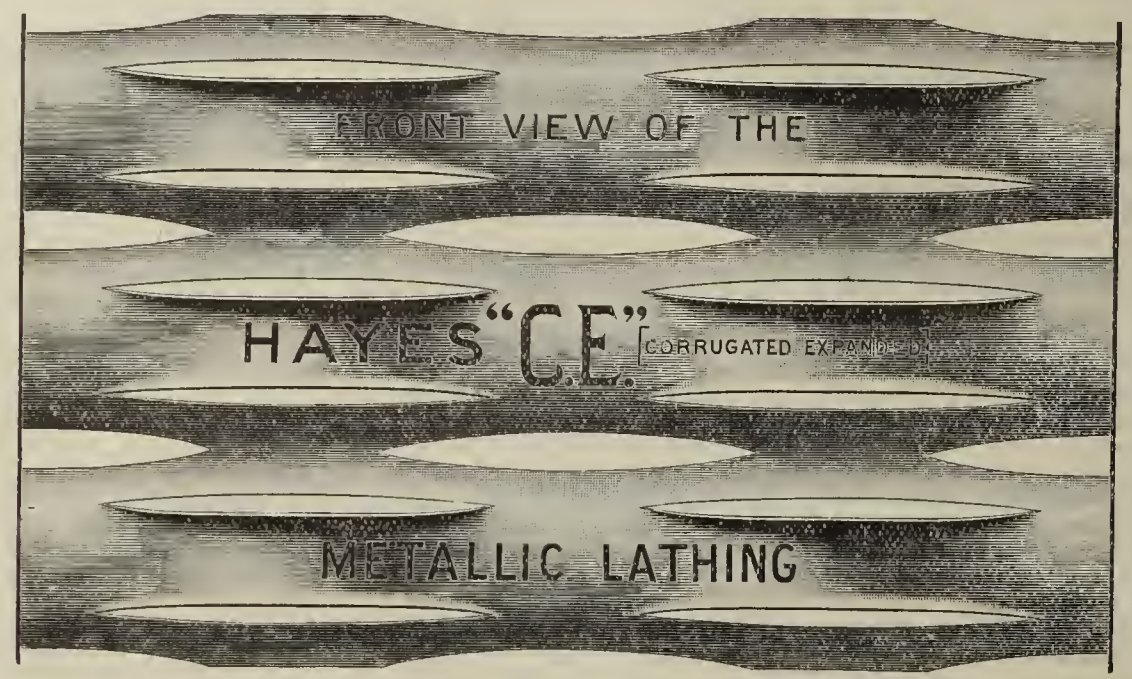
ROOFING AND CORNICE.

Hayes C. E. Metallic Lathing.

George Hayes, 71 Eighth avenue, New York City, whose inventions in connection with architectural engineering are well known, has just brought out a new invention in metallic lathing, to be known as the Hayes C. E. (corrugated expanded) lathing, of which an illustration showing front view is presented herewith. This lathing has been patented in the United States and foreign countries.

The system is described as follows: He takes a sheet metal blank, say 30 x 96 inches, corrugates the same and otherwise forces it out of plane, after making, at prescribed intervals over its entire surface, certain slits or openings which, in the process of manufacture, are expanded, the outlines thereof being double arc lines, one on each side of the chord, forming lanceolated openings, their axes representing the true length of the metal employed. These apertures are arranged longitudinally, occurring in the depressions, while upon the elevations are formed a series of arched loops having a concave crown. The depressions and elevations form the corrugated surface, while the loops give the appearance of transverse corrugations. Strange as it may appear, and in seeming conflict with the inflexible law of geometery, this divergence from the plane of the sheet and from the axis of the openings does not, it is claimed, detract from the original flat sheet, either in its length, width or thickness, producing a sheet of finished lathing 30 x 96 inches. Moreover, it is pointed out that a sheet of metal lathing so corrugated partakes of all the strength and rigidity of an ordinary corrugated sheet, and when reinforced with plastic material becomes as substantial as a slab of stone. Among the advantages claimed for this lathing are that it is easily handled and applied; that there are no cutting edges or points to injure the hands; that it is readily cut to any size with an ordinary pair of tinsmiths' shears and can be readily bent into any form. It possesses a most perfect clinch or bond for the mortar, can be plastered on both sides and does not permit a free escape or waste of mortar.

The use of this material for inexpensive fire proof construction is alluded to, and it is pointed out that any timber constructed building may be rendered practically incombustible by its use, conjoined with that of plaster. It is recommended particularly for the inclosing of elevator and dumb waiter shafts, and for partitions, where a double plastered face is made from 1 to 2 inches in thickness, thus effecting a material saving in floor space.

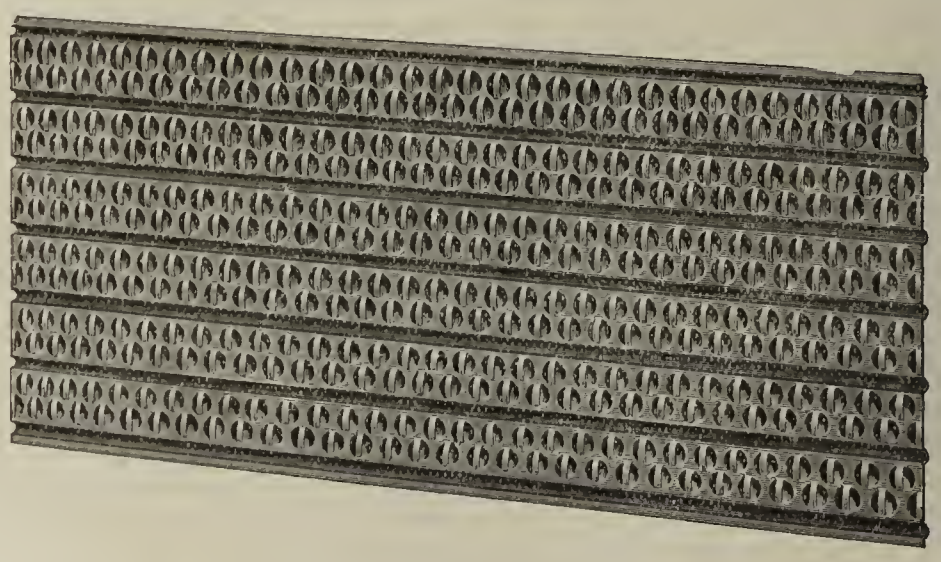


Front View of the Hayes C. E Metallic Lathing.

THE INDIANA PAINT & ROOFING COMPANY, 42 West Broadway, New York, make a specialty of sheathing papers and silica paints for roofing. They are issuing at the present time an attractive little four page booklet, "To Men of Real Estate," that is well calculated to direct the attention of all who have anything to do with roofs or roofing to their roofing materials.

The Kansas City Metal Lath.

The Kansas City Metal Roofing & Corrugating Company, Kansas City, Mo., are placing on the market the Kansas City metal lath, which is claimed to be exceptionally stiff. The lath is made of No. 29 United States gauge sheet steel in sheets 27 x 48 inches. It has half round ribs or corrugations 3¼ inches apart, which run the full length of the sheet, thereby securing great strength and stiffness. Between these ribs slots are arranged with depressed lips, forming an incline upon which the mortar easily slides through to the back, where it forms a perfect lock or clinch around the strap between the depressed lips, thus avoiding any waste of plaster, and at the same time, it is said, the plaster will adhere firmly to the surface of the lath. The Kansas City Metal Roofing & Corrugating Company report



The Kansas City Metal Lath.

a good demand for this lath, and state that the architects and builders who have used it speak very highly of its merits.

FLASHINGS.

THE CINCINNATI STAMPING COMPANY, Cincinnati, Ohio, issue a special circular relating to the Reagan metallic shingles which they manufacture. It is a pamphlet of convenient size, shows separate views of the different patterns of the shingles, including the Alexis and Gothic; also general views of roofs with the shingles applied. Other illustrations show valleys, gutters and ridging. Full descriptions accompany the cuts and a price-list is given of the goods. Three pages at the close are devoted to signed and dated testimonial letters which speak in high terms of the Reagan shingle.

THE NEW EDITION of the illustrated catalogue of Vaile & Young, Baltimore, Md., is an exceptionally neat and pleasing publication. It is a small volume bound simply in blue card covers, carrying the name of the firm and reference to their patent metallic skylights without putty and a cross section of skylight bar as a front page. A dozen pages are devoted to a careful and accurate description of their well known skylight, the description being made plain by the aid of illustrations. Smaller cuts are also shown of hipped and turret skylights, &c. The remainder of the pamphlet contains half-tone engravings showing a large number of buildings where these skylights are in use. One of the folder pages shows a general view of the Marine Department of the Maryland Steel Company, on whose buildings Messrs. Vaile & Young have erected over 60,000 square feet of skylights. A handsome picture is presented of the new Library Building of Congress calling for 14,000 feet of skylight construction in copper. Other prominent buildings are included in the illustrations.

THE KANSAS CITY METAL ROOFING & CORRUGATING COMPANY, Kansas City, Mo., have just completed the decoration of their president's office in the Builders and Traders' Exchange. The decoration consists of an artistic and elaborately designed ceiling and side walls of stamped steel, made by the Wheeling Corrugating Company, for whom the Kansas City Metal Roofing & Corrugating Company are general Western agents. On May 22 an informal reception was held, to which the architects and builders of Kansas City were invited and expressed themselves in complimentary terms regarding the interior decoration above referred to.

THE FOSTORIA STEEL ROOFING COMPANY of Fostoria, Ohio, have just issued their sixth catalogue. This is a handsome publication of 68 pages, bound in stiff paper covers, with an embossed gilt title. The contents begin with an illustration of tubular seam steel roofing, together with a full description of the manner in which it is laid. Then follows pressed standing seam roofing, for laying which full directions are also given. After this comes V crimp roofing. This is succeded by sheet metal weather boarding, beaded siding and ceiling, pressed corrugated iron and steel, corrugated iron elevator siding, climney flashings, sheet steel pressed brick, rock face brick siding, sheet steel imitation stone panel, window and door casings, corner boards, corner caps, ridge rolls, &c. A valuable feature in connection with sheet metal specialties is the practical nature of the directions for applying them. Rules of measurement are given, as well as tables showing approximate weights of different kinds of roofing and siding. A separate department of the catalogue is devoted to eave troughs, miters, box gutters, corrugated conductor pipes, corrugated elbows, plain lock seam pipe, spiral pipe, hangers, finials, &c.

THE MONTROSS METAL SHINGLE COMPANY of Camden, N. J., have just issued a 20-page catalogue of their goods. In an announcement on the opening page the company state that they are alive to the fact that every order they fill is an advertisement either for or against them, and that as the manufacture of their line of goods constitutes their sole business, they cannot afford either to use inferior material or to slight the workmanship. The Gothic tile, Diamond tile, metal slate or shingle, Eastlake, Octagon shingle and special valley, made by this company, are all described and illustrated, and there are also illustrations of buildings covered with the tiles and shingles.

THE KANNEBERG ROOFING COMPANY, Canton, Ohio, have recently placed in their factory three new machines of their own invention for manufacturing corrugated galvanized conductor pipe. They claim this greatly improved machinery enables them to make the pipe in 10-foot lengths, with the corrugations deep, round and of uniform size.

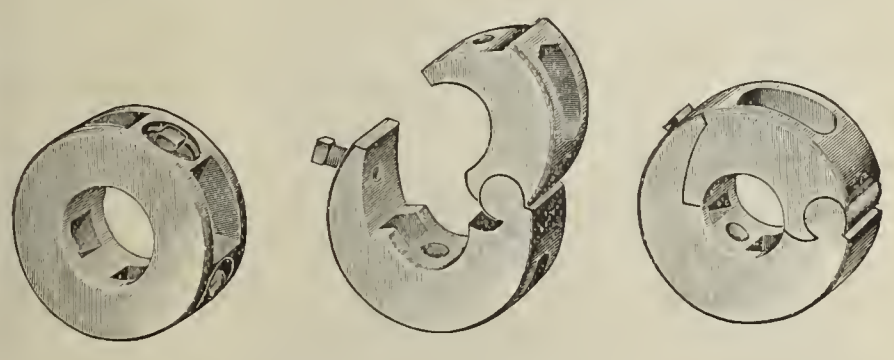
GOOD & WATERMAN, Laclede Building, St. Louis, have been appointed agents for St. Louis and vicinity for the sale of Walter's shingle, made by the National Sheet Metal Roofing Company, Jersey City, N. J. They report an excellent demand for these shingles and are now sending sample shingles and catalogues to the trade.

KNORR & BLOCKS, 165 Wells street, Chicago, are to supply the galvanized iron bays and cornices for the store and hall building of J. Geitner, Arlington Heights.

Newport News, Va., the youngest exporting port of the United States, is rapidly advancing to the front rank in importance. Its exports and imports during the past times of dullness and depression are said to have held up phenomenally, thanks to the institution of the Chesapeake & Ohio direct steamship line to Europe, which makes the port its headquarters. The Chesapeake & Ohio Railroad Company have millions of dollars invested in the place, and it is stated that President Ingalls of that road is about to sail for Europe to engage more steamships for the line.

The Giant Safety Collars.

These collars, which are shown in both the solid and split forms in the accompanying engravings, are chambered so as to avoid unnecessary weight upon the shaft, but this is done in such a way as to preserve full bearing surfaces at each end. The split collars have a hinge joint and may be put upon the shaft in a space equal to their length. When in place, the set screw that holds the collar together also secures it in position on the shaft. No bolts are used, and the set screw heads do not project above the surface. These collars, which are made by the Gouverneur Machine Company of Gouverneur, N. Y., have all the strength required, and all useless weight is avoided.



Solid. *Split, Open.* *Split, Closed.*

THE GIANT SAFETY COLLARS

SCRAP.

J. IRVING ROGERS, 53 Newcombe street, Liverpool, is sole agent for the United States and representative for the home trade for Cook Jenkins' tin house bran. He issues a circular price-list, giving the cost per net ton of the different qualities of meal and bran.

MARSHALL BROS. & Co. of Philadelphia have been compelled to shut down their rolling mills and tin plate works for want of fuel.

N. & G. TAYLOR COMPANY issue notice that for the benefit of the trade in Syracuse, N. Y., and vicinity, they will carry a full line of their guaranteed and special brands of roofing tin at 339 West Fayette street, Syracuse, N. Y. They request that all orders be addressed to N. & G. Taylor Company, Syracuse, N. Y.

The coal supply on the Duluth docks, Duluth, Minn., is reported as shrinking rapidly. Should the present rate of shipment continue the supply cannot last for more than two or three weeks longer.

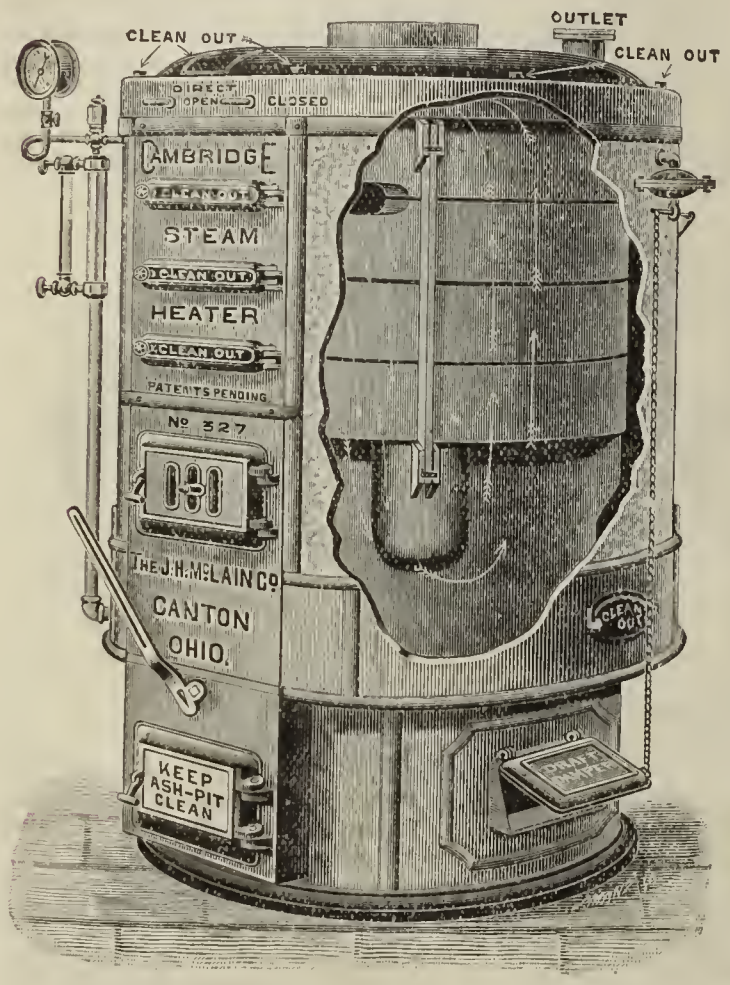
The Panama Railroad Company, since their disagreement with the Pacific Mail Steamship Company, have made arrangements for operating their own steamer service to Colon. For this purpose three vessels of the defunct Brazil Steamship Company, and now owned by the Standard Oil Company, have been chartered and are being fitted out in the Erie Basin.

STEAM AND HOT WATER.

The Cambridge Steam Heater.

The J. H. McLain Company of Canton, Ohio, have just brought out a new steam heater, christened Cambridge, which is herewith illustrated in Fig. 1.

The heater is built up of sections, Fig. 3, on the top of which is placed a smoke dome with an extension to receive the jacket. The sections are divided into tubes running from the front to the rear of the heater, these tubes being shaped and placed as shown in the sectional cut, Fig. 2. By this arrangement the manufacturers claim that the flames envelop each and every tube impinging against the bottom of the steam dome, thus preventing any deposit on the heating surface. The section next to the steam dome is used as a superheating chamber, and it is claimed that the steam entering the pipes will show a much higher temperature than is indicated by the pressure gauge. By closing the draft dampers the heated gases are directed down between the front of the heater, and then passing around the channel irons sweep over the entire surface of the heater before reaching the outlet in smoke dome. The Chicago agents for this company are the Illinois Heating Company, 88 Lake street.



The Cambridge Steam Heater.—Fig. 1.—General View with Casing Broken Away.

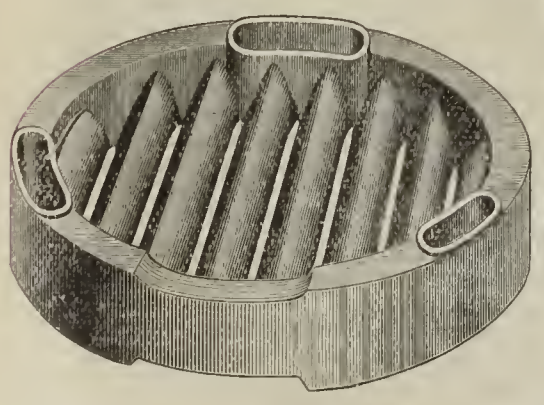


Fig. 3.—General View of Section.

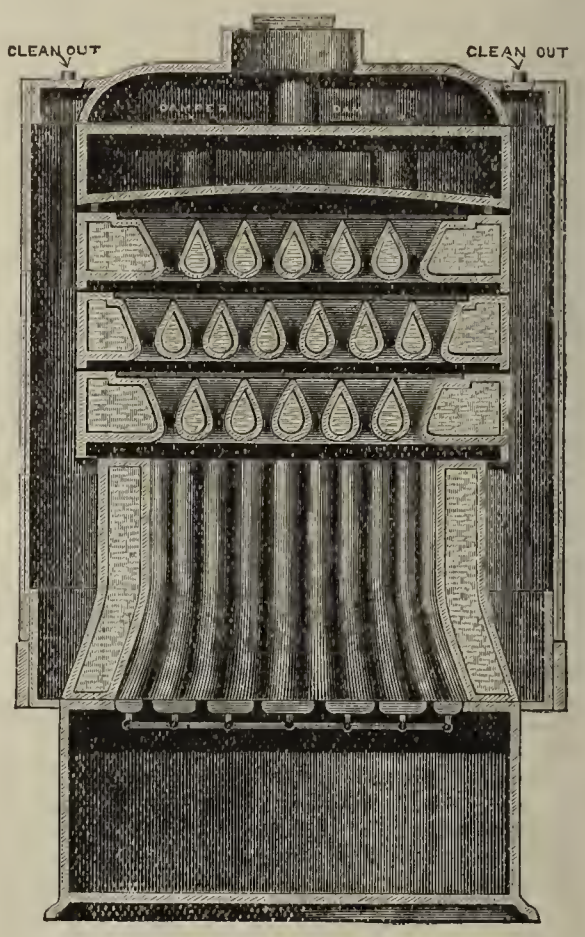


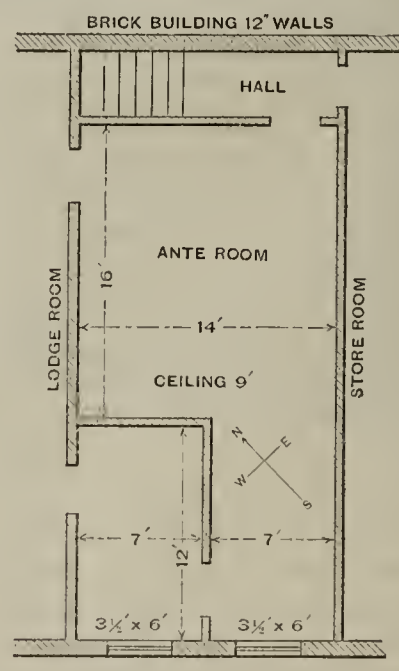
Fig. 2.—Sectional View of Heater.

THE HERENDEEN MFG. COMPANY, Geneva, N. Y., send out postal cards printed in red and green ink directing attention to their book on home warming and ventilation, which they distribute on application. Incidentally the postal refers to the merits of the Furman boilers.

A NEW COMPANY have been formed under the name of the Royal Steam Heater Company, Gardner, Mass., and have purchased from the Cen ral Oilgas Stove Company the patterns, &c., of the Royal Heater, which they will manufacture and sell. They will also erect steam and hot water heating apparatus. A new factory is being built, to be occupied by the company by July 1. The officers are J. R. Davis, president; C. O. Burt, vice-president; E. O. Drake, treasurer.

Apportioning Radiation.

From L. A. H., *New York.*—I inclose a sketch of two rooms on the third story of a brick building located in Westchester County, N. Y., which are used as anterooms to a lodge room. They have about the same amount of exposed wall and glass surface, although in their cubical contents there is considerable difference. I wish some of



Apportioning Radiation.

the readers of *The Metal Worker* would enlighten me as to the proper amount of radiation to heat these rooms by steam to a temperature of 70°. I would like to have the rule for figuring the radiation, and what difference should be made if the room faced north instead of south.

HEATING NOTES.

J. H. WALLACE, Pine Bush, N. Y., installed a Royal steam heater in the Reformed Church at Montgomery, N. Y., which a recent issue of the church paper praises highly.

THE WALWORTH MFG. COMPANY of Boston, Mass., have engaged a suit of rooms at the Broadway Central Hotel for use in displaying their various pipe fitting tools and steam and hot water heating goods and appliances during the steam fitters' convention in June. Their New York office is at 56 Beekman street, where a variety of their goods are shown.

SMITH & ABBOT COMPANY have been organized at Portland, Maine, for the purpose of making and selling steam and other heating apparatus and lighting and electric fittings.

THE J. H. MCLAIN COMPANY, Canton, Ohio, will have a full line of their Canton heaters on exhibition at the coming convention of the Master Steam and Hot Water Fitters' Association of the United States, which is to be held on June 19, 20 and 21 at the Broadway Central Hotel, New York City. The company will be well represented and hope to meet all their friends on the occasion. Their New York office at 69 Centre street is now fully equipped with sample heaters in charge of D. R. McCallum, who will attend to the wants of the trade in the heating line.

THE RICHMOND STOVE COMPANY, Norwich, Conn., distribute to their agents special illustrated catalogues relating to the Richmond heaters for steam and hot water. One circular, larger than the usual size, is issued to the Pond & Hasey Company, Minneapolis, Minn. In addition to the usual descriptions and illustrations of their goods, at the end are a number of halftone engravings showing residences in Minneapolis heated by their apparatus. A second circular carries the name of G. W. Dodson, Lawrence, Mass.

C. M. CONVERSE has opened an office at 96 Lake street, Chicago, representing the Elwood Iron Works, manufacturers of radiators, at Elwood, Ind.

THE STOCKHOLDERS of the Sperl Heating Company held a meeting last week and elected the following Board of Directors: E E. Hendrick, A. P. Trautwein, C. E Rettew, Edward Clarkson, E. W. Jackson, A. D. Harding and Thomas McDonald.

THE J. H. MCLAIN COMPANY, Canton, Ohio, have just opened an office at 1528 Champa street, Denver, Col., with G. B. Laramie, recently assistant manager of the American Boiler Company, Denver, in charge. They will carry a full line of Canton heaters for hot water, steam and warm air.

THE SMITH & ANTHONY COMPANY, Boston, Mass., through their New York house at 56 Beekman street, have engaged space at the Broadway Central Hotel for the exhibition of their hot water and steam heating goods during the convention of the master steam fitters. They will also have a room where they will receive and entertain their guests. The showrooms on Beekman street have been specially arranged with a view to presenting many attractions to the visitors to the convention, the Sanitas specialties occupying the position of honor.

AT A RECENT MEETING of the stockholders of the Gurney Hot Water Heater Company of Boston, Mass., it was unanimously voted that the name of the company be changed to the Gurney Heater Mfg. Company instead of as heretofore the Gurney Hot Water Heater Company. The company therefore will on and after June 1 be known under the title of the Gurney Heater Mfg. Company. The officers of the company are Edward Gurney, president; John A. Fish, vice-president; John M. Paisley, treasurer, and William T. Isaac, secretary. The company state that as they have added to their list of manufactures steam boilers and steam radiation, and inasmuch as the former designation of the company had limited their apparent operations to water heating apparatus, they decided to change their name slightly as above in order to specify without radical alteration more fully and broadly the field of their future operations.

WE ARE IN RECEIPT of an interesting batch of advertising matter from the Herendeen Mfg. Company, Geneva, N. Y. One of the pamphlets, entitled "Home Warming and Ventilation," is the third edition of this little work that the firm have published. The volume comprises extracts and articles by many well known authorities. Another pamphlet is the special florists' edition of the catalogue and shows the Furman heater in various styles and likewise presents illustrations showing the heater adapted to greenhouse work. Another pamphlet, very prettily gotten up, is entitled "The Faultless Furman Hot Water and Steam Boilers," being the regular catalogue with illustrations, description, price lists and references. Accompanying the pamphlet is a circular relating particularly to the Furman Junior hot water boiler, which is a small heater with a grate 12 to 14 inches in diameter and standing from 35 to 48 inches high. It is adapted particularly for conservatories, small dwellings, bathtub heaters, laundries, barber shops, &c.

The American House Beautiful.

In referring to the homes of American business men and contrasting them with the stately and the cottage homes of his own land, a writer in a late issue of *All the Year Round* presents the following views, which may prove interesting to many of our readers:

We Englishmen are proud, and justly so, of the stately and the cottage homes of our land. There is nothing like them elsewhere in the world, for they possess peculiar features of their own—the former in their antiquity and their associations, the latter in their own beauty and that of their surroundings. But the great mass of us live neither in stately homes nor in cottages, and of our residences—externally, at any rate—we have very small reason to be proud. Now, as the Americans have no stately homes of our English type, with the exception of the fine old colonial residences of Virginia and New England—and as their cottage homes are modern, practical and consequently ugly, and, as we have said, there is a wealth of refinement in many American minds, they have succeeded in making the villa residences of their big city suburbs the most beautiful in the world. I call them "villa residences," despite the fact that many of them are mansions in size and feature, because they are the homes of business men. The town residences of American business men are beautiful internally, but being in streets and rows they necessarily lack the external features which induce us to select the suburban home as a type of the American House Beautiful.

ORIGINALITY IN DESIGN.

In a survey of these the first fact which strikes the eye of the stranger is the extraordinary fertility of the American architectural brain in original design. A family likeness pervades all London suburban houses, be they north or south of the Thames. If there be one pretty house, there will be scores exactly like it all around: but until within the past very few years the London suburban builder reared as fast, as cheaply, and, in consequence, as inartistically as he could, with the result that the very great majority of London suburban houses are absolutely hideous. But in an American suburb, let us say for example, Brookline, near Boston, a suburb extending over miles of hill and dale, and planted thickly with houses, it may be asserted that not half a dozen buildings are exactly alike. The straining after the original and the striking has, of course, resulted in the erection of a few monstrosities, and of some houses more eccentric than pleasing in design, but the general average is exceedingly high. In this general originality of house design I seem to see a far greater instance of the much vaunted American liberty and independence than in any of the political and social institutions of the country.

INTERIORS.

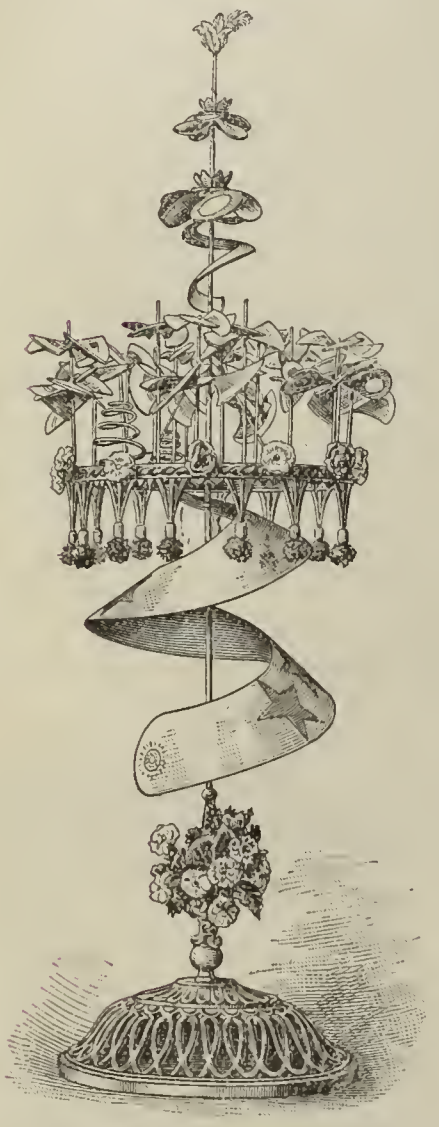
After we have surveyed the exteriors of the houses and proceed to their interiors another new fact strikes us, and this is how very much better the different classes of American business men are housed than are their corresponding grades in our own country. Shop walkers, counter men and good artisans go home every evening to houses which in England would not be deemed unworthy of city men of good position. The taste in furnishing and decoration may not always be as good as the houses themselves, but there is nothing corresponding to what may be called our London "genteel villa residence," and the bank clerk, instead of huddling in one yellow brick box in a long row with a big name shuts himself up for the evening in his own little detached castle, which contains on a small scale all the accommodation and many more of the conveniences of an English gentleman's house. As we rise higher in the scale we reach the American House Beautiful, as distinguished from the American House Magnificent.

The recent rainfall was the heaviest ever recorded in Pennsylvania during the month of May. In five days of last week more rain fell in Philadelphia than during the whole month of any previous year since 1852. The damage caused by floods in the Susquehanna and Schuylkill valleys reached several millions of dollars. Happily the loss of life was comparatively small.

The war on immigrant rates from the Eastern seaboard to points west of Chicago and St. Louis is at last ended by agreement between the Western railroads.

A Novel Stove Ornament.

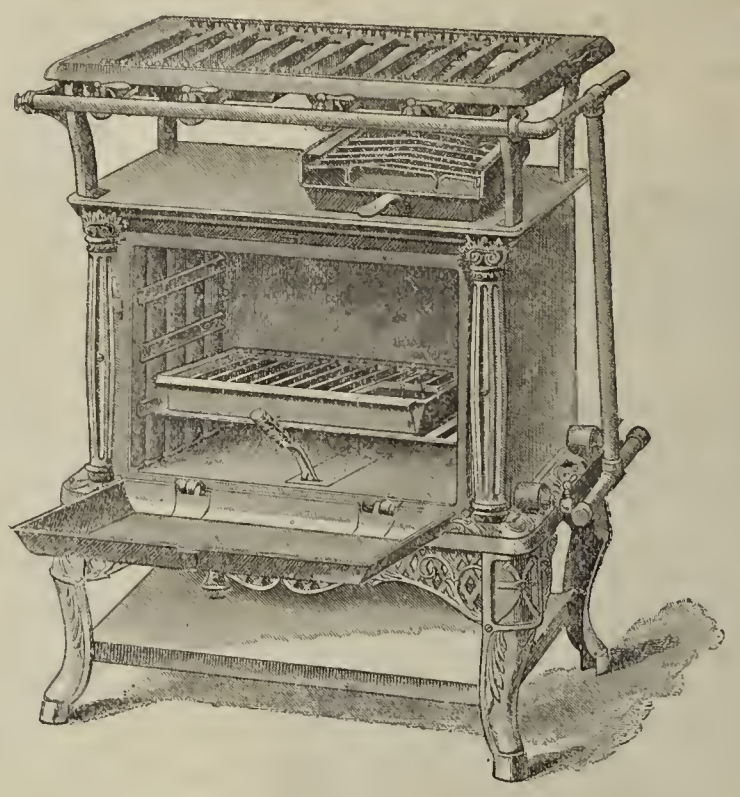
The illustration shows a piece of the handiwork of John J. Fones, a native of Pawtucket, R. I., and now foreman of the sheet iron shop of the Richardson & Morgan Company, 92 Beekman street, New York. Mr. Fones, who is over 60 years of age, speaks of the first 19 years of his practice as sheet iron butchery of the "trim and fit" character. He says *The Metal Worker* first inspired him to work on a different line, and as a result he left his native town in order to receive the night instructions given to mechanics in New Haven by the professors of Yale College. He applied himself to the study of geometry and acquired the art of pattern cutting to the absolute disuse of all "trim and fit" methods. The ornament shown in the illustration is supported by a brass tube attached to the top of a stove, and consists of a hub with arms connecting with circular hollow tubes forming the frame of the revolving ornament. Holes drilled in these tubes support wire shafts which fit into glass bearings in air wheels resting upon them. The upper portion is made to revolve by the pressure of the air heated by the stove rising against a cardboard spiral fastened to and suspended from the hub by wires. There are 45 air wheels of various sizes, but all of different shape, some revolving in one direction and some in the reverse direction. Some of the wheels are in one piece, others have as many as 24 pieces, and the patterns for all were developed by the same rules that daily apply in pattern cutting. The wheels are covered with colored enameled papers, tinsel rosettes and artificial flowers, which give it a very gay appearance, and when in motion it is quite a fascinating sight. This ornament is only one of several that have been made for different parties, no two of which have been exactly alike.



A Novel Stove Ornament.

The Wolff Gas Cookers.

The illustrations presented herewith show the Wolff gas cookers manufactured by the Wolff Gas Radiator Mfg. Company, 164 Franklin street, New York. Fig. 1 shows the Wolff gas range, which is possessed of many attractive features. In appearance it is substantial without being cumbersome. The top is rather novel in construction, consisting of an outer frame with a series of removable bars resting just above the burners on which boilers or kettles may be placed. The burners located just below these bars are covered with an irregularly perforated cast iron plate having projecting pins on the lower side through which the flame plays. In operation this plate and the pins become red hot, throwing a strong radiant heat against the vessels for cooking food in addition to the heat of the gases which play around them. As is shown in the picture, these burners are raised slightly above the top of the oven, so that steaks or articles to be broiled can be placed on top of the oven under the burner. The construction and arrangement of the oven is such as to get the full effect of the gas consumed. The burner is made in two parts at the front and back of the oven and may be lighted by lifting out the plate in the bottom of the oven, which is shown with a lifter in it. The flames of the two parts extend all across the oven, thoroughly heating it, and the products of combustion pass up the sides of the oven through circular tubes which heat the oven on the sides. These tubes being within the casing of the oven proper, the outer sides of the oven are but little heated and but a small heat is thrown off into the apartment in which the stove is used. These tubes enter a chamber at the top of the oven by means of a flue, the heat being distributed over the top of the oven and then passing down to an outlet at the bottom of the oven at the back. This range is made in two sizes. Fig. 2 shows the Wolff gas cooker, the burners on the top of which are the same in construction as those on the gas range, and the broiler beneath them has the advantage of a door so that roasting as well as broiling can be done. By means of a portable oven resting on top of the cooker baking can be done. The cookers are also made in two sizes.



Wolff Gas Cookers.—Fig. 1.—Gas Range.

The feature of both the ranges and cookers is their ample capacity in the oven and broiler space.

The official returns of the foreign commerce of New York for the month of April show a considerable decrease as compared with the corresponding month of last year. The total figures are: April 1894, $81,095,074; April 1893, $101,003,716; a falling off of $19,908,642. This decrease is mainly due to the loss of imports, which amounted to $17,273,203, while the movement of specie shows a decrease of nearly $3,500,000. In merchandise, exclusive of specie, the exports show a gain over last year of nearly $2,000,000. For the first four months of the calendar year the imports of merchandise reached $148,511,981, against $230,948,996 last year, and exports $116,724,460, against $100,939,451.

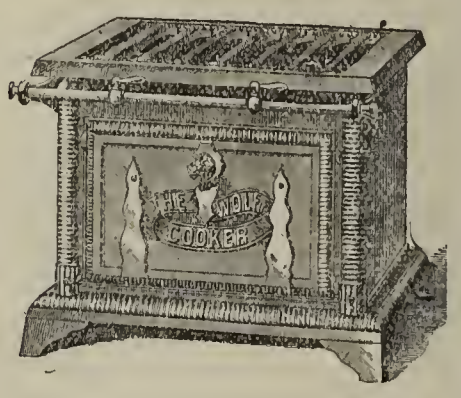


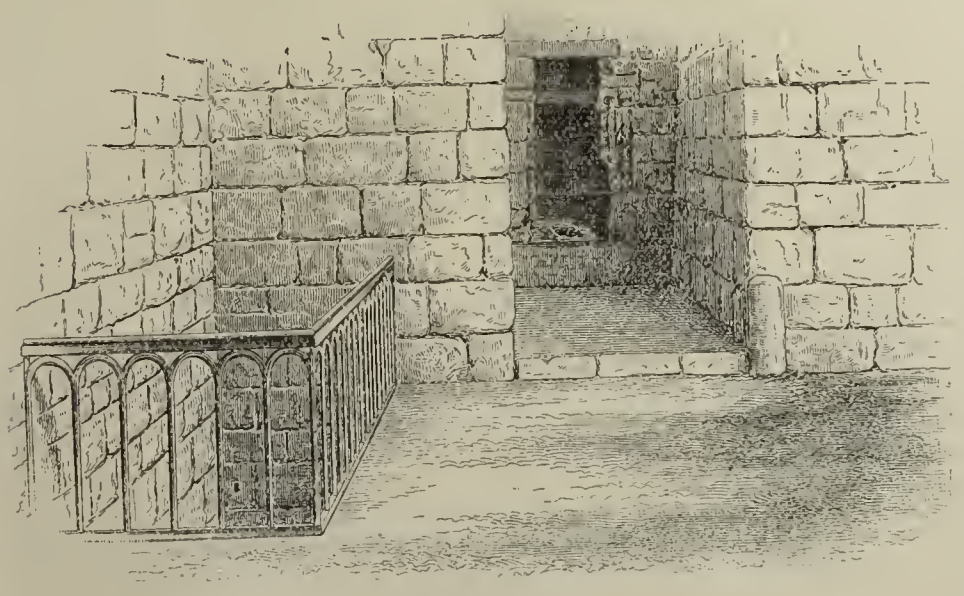
Fig. 2.—Wolff Gas Cooker.

STOVE TRADE NOTES.

A Very Old Furnace.

We have within recent years printed several descriptions of old stoves, most of them of early American manufacture. Some of them have dated back but 20 years or so, others had their origin before the Declaration of Independence, and there were one or two, if we remember rightly, that were made on the other side of the ocean a century or two ago. The illustrations have shown various degrees of crudity in design and decoration, but all have been interesting as types of manufacture at different periods, showing how the art of stove founding has progressed toward both greater utility and a higher standard of decoration.

Now we will go backward still further in the history of house warming and give an example of a much earlier type of heating apparatus than any of those we have heretofore presented; the heater in mind is in fact the progenitor of the hot air furnace and belongs to the class of apparatus that the ancient Romans used in connection with their famous public and private baths. The accompanying engraving, which wss made from a photograph, shows very imperfectly a Roman bath and hypocaust as they may be seen today in the city of Chester, in England. The apparatus, if we may so term it, is beneath a little stationery shop and was unearthed some 75 years ago, but though the masonry was built very many centuries ago the workmanship was so admirable that it appears to be hardly more than 100 years old. The city of Chester was an old fortified camp of the Romans and the bathing establishment we illustrate was built during the first century. The fire pot of the heating apparatus, or hypocaust, is a low stone room, entered through the doorway shown at the back of the picture. Here the fire of wood was built and the heat transmitted through the ceiling to the room above. The bath, of stone, shaped much like a modern bathtub, though longer and very much deeper, is now surrounded by an iron railing, as shown at the left of the engraving. It is in excellent preservation and is water tight to this day. The following particulars of the apartment are from Hemingway's History of Chester: The bath is 10 feet long. 7 feet deep and 4 feet wide (date A.D 95). The hypocaust is 18 feet long, 8 feet wide, over which is the sudatorium (or sweating room), of the same dimensions. The roof of the hypocaust is of Roman tiles, 3 inches thick and 19 inches square, perforated with small holes 6 inches apart. Immediately over these tiles is a bed of finely powdered lime 9 inches thick, for the purpose of conveying the heat (and preventing the smoke) to the sudatorium above, around which are seats, on which the bathers sat until the heat from the hypocaust threw them into a free perspiration, after which they were scraped with a bronze instrument called a strigil (by which means all impurities were removed from the skin). They were then shampooed, rubbed down with towels (lintea), perfumed and anointed with oil, after which they retired to the anteroom (tepidarium), where they waited until quite cool before returning into the open air.



A Very Old Furnace.

ODD PLATES.

Many of the storage warehouse companies in the city, says a writer in a Boston, Mass., paper, have this season inaugurated a new plan in regard to taking stoves for storage during the summer, and are refusing to store them unless the fee is paid in advance or they are stored with other articles. The reason for the step is that many of the companies have had valueless stoves left on their hands by the owners, who replaced them with new ones in the fall. The stove then had to be kept for a long while, and if the owner refused to take it away it was sold for old metal at a low price, so that the total loss to the company was considerable. A few companies in the city take stoves of all kinds on storage as formerly, but even those doing so complain that the business is attended by a loss.

At a meeting of the stockholders of the Mobile Stove & Novelty Works, held on the evening of Thursday, May 17, Adam Glass, A. H. Spira, T. S. Fry, E. E. Posey, William Edgur, William Stou z and J Thompson were elected directors.

We learn from the J. H. McLain Company, Canton, Ohio, that they have about ready for the market their new warm air furnace, called the Oxford Perfect Blast. They have already issued advance sheets of their warm air catalogue, which are ready for the trade.

A recent issue of the *Herald*, published at Quincy, Ill., is authority for the statement that Henry D. Csstle has disposed of his interest in the Comstock-Castle Stove Company of that place, and will engage in business in New York City.

John Keyser, the veteran stove manufacturer, of 115 Beekman street, New York, closes his business career upon July 1 next. Mr. Keyser is hale and hearty at the age of 76 years, 55 years of which have been passed in intense business life as a manufacturer of stoves and furnaces and an inventor. Mr. Keyser was born in Westport, Conn., and began business in 1837 as a polisher of stoves at 247 Water street, New York. In two years' time he was in the position of an employer, and has remained so ever since. Altogether he has taken out 32 patents for stoves and furnaces. He has had a checkered business career, having at one time been the head of a very large enterprise, but like the majority of other men in active industrial life he has been overtaken at times by disaster. The work of his life that Mr. Keyser dwells on with pardonable gratification are the charities and reforms of one sort or another with which he has long been associated. Mr. Keyser will make his home at Hartford, Conn.

Hansell & Belson have issued a notice to the trade to the effect that they have located at 144 North Second street, Philadelphia, Pa., for the sales agency of Charles N. Noble & Co.'s full line of stoves, heaters and ranges. The firm also carry in stock a full line of steel ranges, gasoline, oil and gas stoves, refrigerators, ice chests and numerous side lines adapted to the wants of the trade.

William Resor & Co. of Cincinnati, Ohio, are making their Monitor parlor wood base heater in three sizes, adapted to take in wood 21, 23 and 25 inches in length. Strong claims are made for this heater, and those who have used it testify in flattering terms to the satisfaction which it has given.

A little boom in gasoline and oil stoves is reported from some sections of the West. The coal miners' strike has completely cut off the supply of coal in various districts, and the farmers are without fuel. They are thus forced to seek a substitute or go with uncooked food. Gasoline or oil cooking stoves fill the gap admirably at this season of the year, and very probably farmers'

wives will bless the day when they were driven to this pleasant method of cooking in warm weather.

THE SHOW WINDOW of Landon & Ketchum, at 23 West 125th street, New York, is made attractive by a display of gas ranges, hot plates, ovens and the Challenge water heater.

J. Q. A. BUTLER & SON are a new firm at 284 Pearl street, New York. Mr. Butler is well known to the stove trade of the city, and the new firm will make a specialty of supplying the trade with any make of stoves, ranges or furnaces that is required. The Beaver stoves and ranges stand first in the lines they will handle, and they will use the show room of the Danville Stove Company for a salesroom. They are New York agents for the coal and gas steel ranges made by the Mason & Davis Company. They will make a specialty of their combination range for both coal and gas.

THE EXCELSIOR MFG. COMPANY of St. Louis, Mo., have issued an illustrated circular bearing date of May 15, and calling attention to illustrations of three new heating stoves which they have added to their line. These are known respectively as the Rival, Hot Blast and Nestor. The first and last named are square stoves, and are claimed to possess greatly increased heating capacity as compared with round stoves of the same diameter. The Rival and Nestor are symmetrical in shape and first class in construction. Special care has been taken to insure efficient combustion, each stove having a circular draft regulator on top, by the proper adjustment of which, it is claimed, the fire can be kept 24 hours with soft coal. The addition of a magazine or feed cylinder allows these constructions to be used as self feeding hard coal stoves. The Hot Blast is of handsome appearance and constructed in a manner to give satisfaction in operation. An ornamental fretwork surrounds the inside structure, the space between the body of the stove and the casing serving to heat the air which finds its way in at the bottom and sides, thus making it practically a "room furnace." The company are also distributing as an advertising novelty a balanced butterfly made of cardboard, one side being printed to represent that insect. The tips of the wings are so weighted that placing the head of the butterfly on the tip of the finger it will readily balance horizontally, and blowing on it gently it will wave and indolently flutter like its living prototype. The unornamented side of the butterfly carries printed matter relating to the Charter Oak stoves and ranges.

THE FAMOUS STOVE COMPANY of Indianapolis, Ind., have issued an exceedingly attractive catalogue and price-list of the Magnet stoves and ranges, which they manufacture in great variety. The 54 pages of which the volume consists are profusely illustrated and carry brief descriptive particulars relative to the goods shown. The Model Magnet range for 1894 occupies the leading place and is offered as a novelty for this season. It is made with six boiler holes, fire box either right or left hand, and is adapted for using hard or soft coal or wood. Under the name Magnet the company offer a new line of four-hole cook stoves of neat ornamentation and embodying the latest improvements. Other goods of interest include the Imperial six hole range, made with two sizes of oven; the Tecumseh, another member of this class; the Best Friend, the Indiana, Black Crystal, Tecumseh and Favorite cook stove; Brilliant soft coal base heater, made plain and full nickeled; the Brilliant surface burner, made direct draft and revertible flue; the Magnet Oak for 1894; the Magnet Todd, for burning wood; the Penn Franklin, for soft or hard coal or gas; the Tecumsch and the Champion Box.

A RECENT ISSUE of one of the local papers contains the following squib relative to a well-known representative of the Portsmouth Stove & Range Company of Portsmouth, Ohio: "Will Stork, with his limbs draped in lavender pants and his feet decorated with shoes which had gained their ideas in color from a New England pumpkin pie, together with other toggery suitable for a tour of the sunny South, left on the morning N. & W. train for Norfolk, Va., where he expects to take sea baths for a week or so to work the old puns out of his system. He also expects to sell stoves and other articles for the generation of artificial heat to the natives. 'Pete' expects to come back completely restored in health, but he will doubtless leave the South all 'stove up.'"

THE UNITED VAPOR & GAS STOVE COMPANY have applied for a charter of incorporation under the laws of Illinois. The location of the company is stated to be in Chicago and the capital stock is placed at $8,500,000. The incorporators are Walstein F. Douthirt, Frank O. Soderstrom and Morris P. Carroll. This is one of the periodical attempts to consolidate the several vapor stove manufactories. We mention the matter merely as an item of current news, which may ultimately develop into something important or else fade gently into oblivion. Thus far but little can be ascertained of the project, and probably nothing will be known until the plans of the projectors are consummated —which will be some time hence. Meanwhile the vapor stove trade will continue to amble forward at its usual pace and every manufacturer will pay more attention to getting orders and filling them than in devising schemes whereby he and his *confrères* may unite their forces into one huge aggregation.

FRIDAY, MAY 25, was a gala day with the Chicago house of the Detroit Stove Works. To properly celebrate the completion and occupation of their new warehouse, the company issued invitations to their numerous friends and patrons to a reception on that day. The invitations were elegantly engraved, as befitted such an occasion. The warehouse, at Twenty-ninth and La Salle streets, was thrown open to visitors from 9 a.m. to 10 p.m. Manager W. M. Shaddinger and Treasurer G. B. Gunderson, supported by a corps of courteous and untiring assistants from their force of clerks and salesmen, exerted themselves to their utmost to entertain the stream of visitors which continued to pour in until late in the evening. A luncheon was served in one of the apartments of the office, but it was not the chief attraction to the callers, who inspected every part of the warehouse and were unsparing in their praises of its admirable arrangement and location. The popularity of Manager Shaddinger was attested by the continuous reception held in his room, every one passing in to pay his respects. The manager's room was bright with flowers. Among the visitors the city stove trade was, of course, most largely represented, but there was also an excellent attendance from outside points. Inquiry was frequently made for President E. S. Barbour, and it was with regret that callers learned of his enforced absence on account of ill health.

THE MICHIGAN STOVE COMPANY have just issued a superbly printed circular entitled "The World's Greatest and Most Profitable Specialty in Oak Stoves." The subject matter treats of Syphon Oak Garlands. These are base heating stoves of the oak type. In them the flue entirely encircles the base, the ashes falling through an opening in the center into a large ash pan. The base flue is brought as near the floor as possible without burning it Access is given to the whole flue space for cleaning. The grate is a novel construction, designed to prevent the formation of clinkers while giving a good exit for refuse. The feed door is on the side, and has a tilting device by which the direct damper is opened whenever the feed door is opened, thus preventing the emission of smoke into the room. An independent hot air circulating flue is provided, through which air enters the bottom of the stove and flows out into the room after being heated. A cut is given showing the bottom of the stove removed, exposing the base flues. Another illustration presents a full view of the stove adorned with richly carved moldings in the top, door piece and base, with nickel foot rail and other trimmings and an artistic urn as a top piece. Comparative prices are given to show that a full base heating stove can be had at a very slight advance in cost over direct draft stoves of equal heating capacity in the company's Garland line.

CHAS. NOBLE & CO. of Philadelphia, Pa., will have several new styles of goods on the market this season, among them being a steel range. They are this week making a shipment comprising 200 heating stoves of assorted styles to Switzerland. The firm have some good foreign trade and make frequent shipments.

THE PENINSULAR STOVE COMPANY of Detroit, Mich., are presenting their agents with neat memorandum books of a size convenient to carry in the vest pocket. In addition to the regular ruled pages for memoranda there is given more or less information of a general character, among which may be mentioned, explanation of storm signals, rates of postage, both foreign and domestic, population of the larger cities in the United States, abbreviated parliamentary rules and usages, what to do in case of accidents and antidotes for poisons. There are also blank spaces to be filled in with the name and address of the owner of the book, together with other particulars, for the purpose of personal identification. Not the least valuable feature is found on the second and third pages of the covers, which carry calendars for 1894 and 1895. The company are also distributing to their friends an interesting assortment of handsomely illustrated cards, aggregating 43 in number. These, as may be supposed, are intended for advertising the company's goods and are calculated to serve this purpose in an admirable manner.

The commencement exercises of the Manual Training School at Camden, N. J., will be held in the Temple Theater June 10.

It has been decided not to hold the International Exhibition at Brussels until 1896.

TRADE REPORT.

The Iron Market.

The scarcity of Coal and Coke is having an increasing effect upon the production of Iron and Steel. Practically the manufacture of Pig Iron in the territory between the Alleghany Mountains and the Chicago district is suspended, and in their efforts to continue running the Steel mills have cleaned up the stock of Bessemer Pig.

The scarcity of soft Coal is beginning to tell on the mills east of the Alleghany Mountains, and together with the floods has caused considerable temporary suspension.

While thus the supply has been very materially curtailed the demand has improved very little. Buyers, except for small lots for immediate delivery, continue extremely indifferent.

Quite a little boom in prices has been worked up over the Italian demand for Old Rails which has been shrouded in so much mystery. Two vessels have been chartered, involving from 2000 to 4500 tons. Under the stimulus of inquiries holders have now worked up their ideas on prices to the point that any further business cannot be done, unless the Italian market goes up quite considerably.

Pig Iron.—The demand for Foundry Iron in the New York market is light, and in spite of the coal miners' troubles, prices remain unchanged. It is possible that some of the Eastern Pennsylvania furnaces will go from Foundry to Bessemer Pig. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.75 @ $10.25.

Some holders of Pig Iron in the Philadelphia district claim to be getting better prices than have been quoted during the past two or three weeks, and look for still better prices in the near future. The market is referred to as badly mixed, however, and all sorts of quotations are given, especially for Foundry grades. A good deal depends on quality and a good deal on the desire to sell, and between the two a variation of 50¢ ℔ ton and upward is frequently met with. The usual quotation for No. 2 X is $11.50 @ $11.75, but sales at $11.25 are not infrequent. Buyers are very indifferent, however, and very few are disposed to contract far ahead even at the extremely low figures now ruling. Low grade Iron is wanted at $10 @ $10.25, delivered, but there is very little to be had at less than $10 50, some being held at a still higher figure. General quotations for Philadelphia or equivalent points are about as follows:

Standard No. 1 Foundry X	$12 50 @ $12.75
Standard No. 2 Foundry X	11.50 @ 11.75
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 11.75
No. 2 Soft	10.75 @ 11.00

Advices from Chicago indicate that local Coke Iron has been in excellent demand in that market. Prices are very firm, makers refusing to give concessions from current rates. Agents of Southern furnace companies report only a moderate business, yet they are receiving a great many inquiries, which are small but more plentiful of late. Some of the Southern companies are completely out of the market and others are out of some grades. The foundries in the Chicago district seem to be able to get enough Coke to keep in operation and less fear is experienced of a Coke famine than some two weeks ago. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10 50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	12.60 @ 13.50
Southern Silvery, No. 1	@
Southern Silvery, No. 2	@
Southern Coke, No. 2	10.00 @ 10.35
Southern Coke, No. 3	9.75 @ 10.00
Southern, No. 1, Soft	10.25 @ 10.50
Southern. No. 2, Soft	10.00 @ 10.25
Tennessee Charcoal, No. 1	@
Tennessee Charcoal, No. 2	@
Alabama Car Wheel	17.50 @ 18.00
Jackson County Silvery	15.00 @ 16.00

The stocks of Foundry Iron at Pittsburgh and in the Valleys are very light, and when the demand increases, as it must when the mills get in good running order again, it is not improbable that higher prices will prevail. Outside of a few unimportant transactions in Foundry there have been no sales for close delivery during the week in the Pittsburgh market. The following prices are asked for spot deliveries:

No. 1 Foundry	$11.10 @ $11.25	cash
No. 2 Foundry	10.50 @ 10.75	"
No. 3 Foundry	9.75 @ 10.00	"

The general undertone of the Cincinnati market for Pig Iron has been strong all the week and especially has Soft Iron been wanted and sold at better prices. The sales were mainly in jobbing lots and of Foundry grades, No. 2 being most in demand, and No. 2 Soft coming full up to No. 2 regular because of its scarcity. The probable advancement of freight rates by the Northern railroads the middle of June has had a demoralizing effect on the market, but it would be difficult to buy much Iron to be shipped before that time. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.25 @ 9.50
Southern Coke, No. 3	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

The cut in Western freight rates, which was withdrawn early in the week, has had a beneficial effect on the St. Louis Pig Iron market. A number of heavy sales have been made which were made possible by the reduced rate. Prices are firm, and a continuance of the Coal strike will cause additional strength. Shipments are being delayed by the inability of consumers to secure Coal and Coke, and without these they have no immediate use for Iron. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry	$11.00 @ $11.25
Southern Coke, No. 2 Foundry	10.00 @ 10.25
Southern Coke, No. 3 Foundry	9.75 @ 10.00
Southern Car Wheel	17.00 @ 18.00
Lake Superior Car Wheel	16.25 @ 16.50

Metal Market.

Pig Tin.—The market appears to be somewhat firmer, although business has not increased and the demand from consumers and interior dealers has been very ordinary, while stock is accumulating in this market. Nevertheless official prices have been marked up a trifle and the jobbing rate for small lots of Straits Pig is maintained at about 21¢ ℔ lb.

Copper.—Business has been slow, and what there was of it passed at practically the same prices that have ruled for some time past. There is little change in the character of demand from home buyers. Prices are rather easy, 10½¢ ℔ lb being the outside asked for small lots of Lake Ingot from store. Casting stock on the same basis is generally quoted at about 9½¢.

Sheet Copper.—Nothing beyond a routine demand of moderate character is reported for Manufactured Copper. Consumers are taking only such limited quantities as they need for immediate use. Prices are, nevertheless, fairly maintained, although competition is as sharp as ever. Production has been considerably restricted of late, and manufacturers are looking to an improvement in prices as soon as general trade conditions are better. Stocks in dealers' and consumers' hands are unusually light.

Pig Lead.—Sales have been moderate and the demand has not changed perceptibly, being influenced very little by the results of the tariff maneuvers. For small lots of American Pig, jobbers ask from 3⅞¢ to 4¢ ℔ lb. Western business is, however, understood to have increased, and a general improvement both in volume of trade and in prices is anticipated in that market.

Lead Pipe and Sheet.—Dealers generally report a demand that is considerably below the average for the season. Some of the larger manufacturers, however, speak of a fairly satisfactory run of trade during the month of May, exceeding their anticipations in some respects. Probably the absolute dearth of speculative building has affected the jobbers, while the usual spring repairs and renewals, added to some substantial building operations of a legitimate character, have served to keep the larger houses busy of late. Prices are unchanged in this section.

Spelter.—There is a somewhat stronger tone to the market, not because of livelier buying in this section or vicinity, but on purchases made at primary points of stock for shipment elsewhere. As there is no surplus stock on the market an early improvement in price is more than likely. Ordinary

Western Spelter, in small lots from store, fetches about 4¼¢ ℔ lb.

Sheet Zinc.—The closing down of the Zinc works, owing to scarcity of fuel, has resulted in a sharp advance on Sheet Zinc during the week, with the likelihood of a further rise in price within a few days, as stocks are by no means excessive in any quarter. For 600 lb casks, 5¢ ℔ lb is the current quotation, smaller lots selling at 5¼¢.

Antimony.—Only routine business has been done, but enough of it to keep the market quite steady. Quotations are unchanged.

Tin Plate.—Business has been somewhat uneven, but the aggregate makes a fair showing, and from all accounts compares favorably with that of the preceding week. Some good sized orders for moderate quantities of Cokes and Bright Charcoal Plates for the out of town trade sufficed, early in the week, to give a firmer tone to the market, as stocks of these Plates are by no means superabundant just now. Prices have, however, undergone little change, but it seems increasingly difficult to buy futures at prices that were commonly quoted a week ago. The prevailing and prospective scarcity of fuel, due to the Coke strike, has caused a rush of orders for domestic Plates. Home manufacturers are unable to make any forward contracts, in view of the more than probable closing down of the majority of Tin Plate works in the near future, owing to the shortage of domestic Black Plates, should the strike continue. As there has been a falling off in importations of Plates during the current year, amounting to at least 1,000,000 boxes, the stocks in hand at the present time are not at all excessive. The market on the other side is reported, too, as being firmer, and all indications point to the next movement of prices as being more likely to be upward than downward. Domestic Roofing Plates are in good demand. In the West, especially, there is a scarcity of this material, and jobbers report that they are unable to accumulate any stock, the Plates being shipped out as fast as received from the works.

A special London cable dispatch of May 30 to *The Iron Age* reports on the British Tin Plate market as follows: Transactions in Tin Plate have been smaller at the recent advance in prices, and there has been quite general tendency toward conservative policy in view of the supposed near approach of the settlement of the American tariff. On the part of sellers there is still a hardening of prices. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20	9/10½	@ 10/1½
Siemens Cokes, 14 x 20	10/4½	@ 10/6
Ternes, double box	18/3	@ ..
Charcoals	11/	@ 13/

There has been quite a heavy inquiry for Black Plates for America. The stock of Tin Plate in England was at that date about 294,000 boxes.

Sheet Iron.—The coal strike, in causing the closing down of mills, has induced a strength in the Sheet Iron market that has not existed for a long time. Black iron, although not very notably active, is more so than has been the case of late, and prices are more firmly maintained. Some makers are quoting an advance, although others ask as low rates as ever. Galvanized Sheets show an improved tendency in price, with buyers urging prompt shipment on contracts. Discount on small lots from store is quoted at 75 % @ 75 and 5 %.

Chicago Report.

Scrap.—Dealers continue the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	...
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	...
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—One of the most active weeks ever known in the Chicago Anthracite trade has just closed. Enormous shipments were made to Missouri river points to take advantage of low freight rates, which were restored on the 28th. In addition to this exceptional demand a considerable business was done with dealers in nearer territory who are now laying in stocks for next winter, taking advantage of prevailing low prices. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto and Ch
Chicago, Ill	$5.00	$5 25
Milwaukee, Wis	5.00	5.25
Kansas City, Mo	8.20	8.45
Council Bluffs, Iowa	8.20	8.45
Lincoln, Neb	8.35	8.60
Sioux City, Iowa	8.20	8.45
Aberdeen, S. Dak	8.25	8.50
Dubuque, Iowa	6.30	6.55
Madison, Wis	6.50	6.75
St. Paul, Minn	7.50	7.75
Burlington, Iowa	6.50	6 75
Des Moines, Iowa	7.95	8.20
Davenport, Iowa	6.30	6.55
St. Joseph, Mo	8.20	8.45
Leavenworth, Kan	8.20	8.45
Omaha, Neb	8.20	8.45

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

HOPKINS & Co., proprietors of the New York Wire Works, at 90 West Broadway, New York, have recently rearranged their warerooms and are making a fine display of Wire Guards, Trellises, Window and Office Screens, and are showing as seasonable goods a line of Lawn Chairs and Tree Guards.

A. L. BURTIS of Lockport, N. Y., whose name many of our readers will associate with short methods of pattern cutting and other ingenuities relating to sheet metal work, is, as some of the trade know, also interested in both music and poetry. By inference we assume that he is also interested in the bicycle, for a recent issue of a local paper gives a very charming song written by him under the title "Wheeling." The writer has caught the spirit of the motion of the bicycle and transferred it in a very delicate way to the rhythm of his verse.

CONDITION OF THE

Hardware Trade.

THERE has been little change in the general situation since our last review of the market. The volume of business is moderate, and is probably diminished by the fact that the end of the month is near. Advices from the retail trade indicate that business is in most sections below the average, but that on the whole the general conditions are fairly satisfactory. While there is less building than usual there is evidently an improvement in this direction, and manufacturers of Builders' Hardware refer to a somewhat increased demand. Seasonable goods are moving in nearly the usual quantities, but even in this branch of trade there is some complaint. In the matter of prices there is little new to report. The raw material is affected somewhat by the existing strikes, but their influence has not as yet been very marked on Hardware. Nails and Barb Wire, however, and some other heavy goods are somewhat stronger in price, and on some lines higher quotations are ruling. The future course of the market is canvassed by the trade with much interest, but as yet there are no indications of an important improvement either in demand or prices in the near future. It is, however, to be expected that a fair business will be done during the next month or two, and it is hoped that in the fall business will assume good proportions.

Advices from Chicago.—The Shelf Hardware trade was further stimulated the past week by the notice of an advance in freight rates to Western points to take effect on the 28th. The Western dealers, who had been expecting low freight rates to continue indefinitely, were then impelled to hurry in their orders for immediate shipment of all classes of goods which they would require for the next two or three months. The activity thus caused has greatly increased the volume of business, but it is expected somewhat at the expense of the immediate future. It will not be surprising if trade should now prove dull for some time until the goods thus shipped are distributed. Manufacturers' agents have recently enjoyed a very much better demand for Carriage Bolts, Machine Bolts and other staple articles which have been ordered by jobbers in much larger quantities, reminding the trade of old time orders. The hardening of prices on raw material may have caused some houses to stock up with goods of this character. Recent prices have been so low that they have little to fear of any further reduction. They may have done wisely in anticipating their future requirements in this way. Roofing Plates continue as scarce as ever, and jobbers state that they are unable to accumulate any stock, the goods being shipped out about as rapidly as they are received.

Notes on Prices.

Wire Nails.—During the past week the Wire Nail market has been steady with a slightly upward tendency. Manufacturers have withdrawn their outstanding quotations at low figures and are now naming $1.15 for carload lots at mill, a figure which is sometimes slightly shaded. The advance in the price of the raw material and the uncertainty in regard to the supply of fuel are the principal reasons for the strength which characterizes this line. The volume of business has, however, fallen off perceptibly, as the trade hesitate about placing orders at the advanced

prices which are ruling, buying only in such lots as are required to meet their present needs. Small lots from store in New York are held at $1.25 to $1 30.

Advices from Chicago.—Manufacturers report rather a quiet week. The advance made in factory prices has been well maintained, but buyers are not inclined to pay the great advance now asked on recent low prices. They are able for the present to supply their wants from jobbers having heavy stocks who are willing to sell at slightly lower rates than manufacturers. This is, of course, only a temporary condition, which may soon be expected to terminate. The higher price of Steel Billets and Wire Rods will probably prevent manufacturers from being in a hurry to reduce their quotations. Factory lots are quoted at about $1.20, Chicago. Jobbers quote small lots at the same price.

Cut Nails.—The Cut Nail market is without material change, though perhaps slightly firmer in the matter of price, in sympathy with the advances which have been made in Wire Nails. The demand is fair, but not especially heavy. The Eastern market is represented by the quotation of 95 cents to $1 for Nails delivered on dock in New York. Small lots from store are held at $1.10 to $1.15.

Advices from Chicago.—The condition of the market continues about as reported last week. Orders are coming in fairly well from jobbers in this vicinity and fromvarious Northwestern points. Manufacturers quotc 90 to 95 cents on 55 cent average. Small lots are sell ing at $1.05 to $1.10 from stock.

Barb Wire.—The demand is only moderate, but manufacturers are well supplied with orders. Prices are well maintaincd, the market being represented by the following quotations for Four-Point Galvanized, delivered at the points named: Pittsburgh, $2.05 to $2.15 ; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Advices from Chicago.—The advance in Western freight rates has had some effect on the Barb Wire trade, but not as great as might be expected. Western jobbers have had previous experience in stocking up on Barb Wire in times of low freights and will not risk being caught again. Manufacturers who had made special efforts to handle a larger trade from that section did not meet with satisfactory returns. Probably they would have done better if they had at the same time cut their prices, but this they were not willing to do with the higher rates ruling on their raw materials. Only a fair business is consequently reported for the week. Manufacturers are now looking forward to a quiet season extending over the summer months. Prices are maintained on a basis of $2 30 to $2.40 for small lots of Galvanized Barb Wire from stock, with 10 cents less for carloads.

Cordage.—The Cordage market continues in excellent condition as regards price, the advances which were recently made being well maintained. The demand is fair, but not especially heavy. It is thought not unlikely that slightly higher prices may rule before long.

Dixon's Cycle Lubricant.—This article is put on the market by the Joseph Dixon Crucible Company, Jersey City, N.J In single gross quantities the price to the trade is $7.50 per gross, and in 5-gross quantities and over $6 per gross.

Phenix Meat Cutters.—Phenix Meat Cutters, manufactured by Sargent & Co., 37 Chambers street, New York, are sold at a discount of 66⅔ per cent. from the following list:

With Clamp, Galvanized.

	Per dozen.
No. 130, small family size	$48
No. 131, large family size	72
No. 132, very large size	120

With Feet, Galvanized.

No. 141, large family size	$60
No. 142, very large size	96

Glass.—The continued bad weather of the past week further curtailed the demand for Glass, though quotations for American Window Glass remain firm at 85 per cent. discount for single and 85 and 5 per cent. for double strength, in car lots. If the coal situation continues as at present it will seriously affect Glass factories depending upon coal for fuel and further decrease production. Plate Glass is quoted at 70 and 10 and 5 per cent. discount, with somewhat of a falling off in demand.

Old Metals.—There is no business of any amount in Old Metals, and prices are unchanged at their former level. The following quotations represent about the prices paid by dealers in this city:

Heavy Copper	℔	6¾¢
Light and Tinned Copper	℔	6 ¢
Heavy Brass	℔	4½¢
Light Brass	℔	3¾¢
Lead	℔	2½¢
Tea Lead	℔	2¼¢
Zinc	℔	2 ¢
No. 1 Pewter	℔	12 ¢
No. 2 Pewter	℔	6 ¢
Wrought Scrap Iron	gross ton	$7.00
Heavy Cast Scrap	gross ton	7.00
Stove Plate Scrap	gross ton	3.50
Burnt Iron	gross ton	2.50

Old Rags, Paper, &c.—The volume of business does not expand to any extent. The market for Paper Stock is quiet, and only small lots are changing hands. Quotations for Old Rags, Paper, &c., are as follows, New York delivery:

No. 1 White Rags	℔	3¼	@ 3½¢
No. 2 White Rags	℔	2	@ 2¼¢
Mixed Rags	℔		@ ¾¢
Blues and 3ds	℔	1	@ 1¼¢
Hard Sized White Shavings	℔	2½	@ 2¾¢
No.1 White Book Shavings	℔	1¾	@ 2⅛¢
No.2 White Book Shavings	℔	1⅛	@ 1½¢
Light Book Shavings	℔		¾¢
No. 1 Mixed Shavings	℔	1	@ 1¼¢
No. 2 Mixed Shavings	℔	¾	@ 1 ¢
No. 1 Printed Books	℔	1	@ 1¼¢
Ordinary Mixed Books	℔	½	@ ¾¢
Newspapers	℔		2-5¢
No. 1 Manila Paper	℔	¾	@ 1 ¢
No. 2 Manila Paper	℔	⅞	@ ¾¢
Bogus Paper	℔		½¢
Common Paper	℔		⅜¢
Straw Chips	℔		½¢
Binders' Clippings	℔		½¢
Jute Butts	℔	1⅛	@ 2 ¢
No. 1 Jute Bagging	℔	1	@ 1¼¢
Mixed Bagging	℔	¾	@ 1 ¢
No. 2 Bagging	℔	½	@ ¾¢
Hemp Twine	℔	2	@ 2¼¢
Manila Rope	℔	2⅛	@ 2¼¢
Jute Rope	℔	1½	@ 1¾¢
Mixed Rope	℔	¾	@ ⅞¢

Old Rubber.—The market is irregular and somewhat dull. Prices are soft, the following being the nominal quotations, New York delivery:

Car Springs, ton lots, ℔	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔	@	.03½
Rubber shoes, less than carloads, ℔	@	.03¾
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔	@	.03¾
White Syringes, ℔	@	.03¾

THE CRANDALL & GODLEY COMPANY, 157-159 Franklin street, New York, are issuing a catalogue of Ice Cream Utensils and Machinery, showing Freezers, Storage Cans, Molds, Ice Crushers and the various paraphernalia needed in the manufacture and serving of ice cream.

Trade Notes.

A PRICE LIST of interest to furnacemen will be found in this issue, in the advertisement of the Excelsior Steel Furnace Company, 38 West Monroe street, Chicago. Prices are given of all sizes of Hot Air Pipe, Elbows, Angles, Dampers, Safety Thimbles, Plaster Collars, Finishing Collars, Box Collars, Stack Collars and Boot Collars. A cut is also shown of a new Hot Air Damper. The coupon is again printed, worth $1 on a first order for $10 or over.

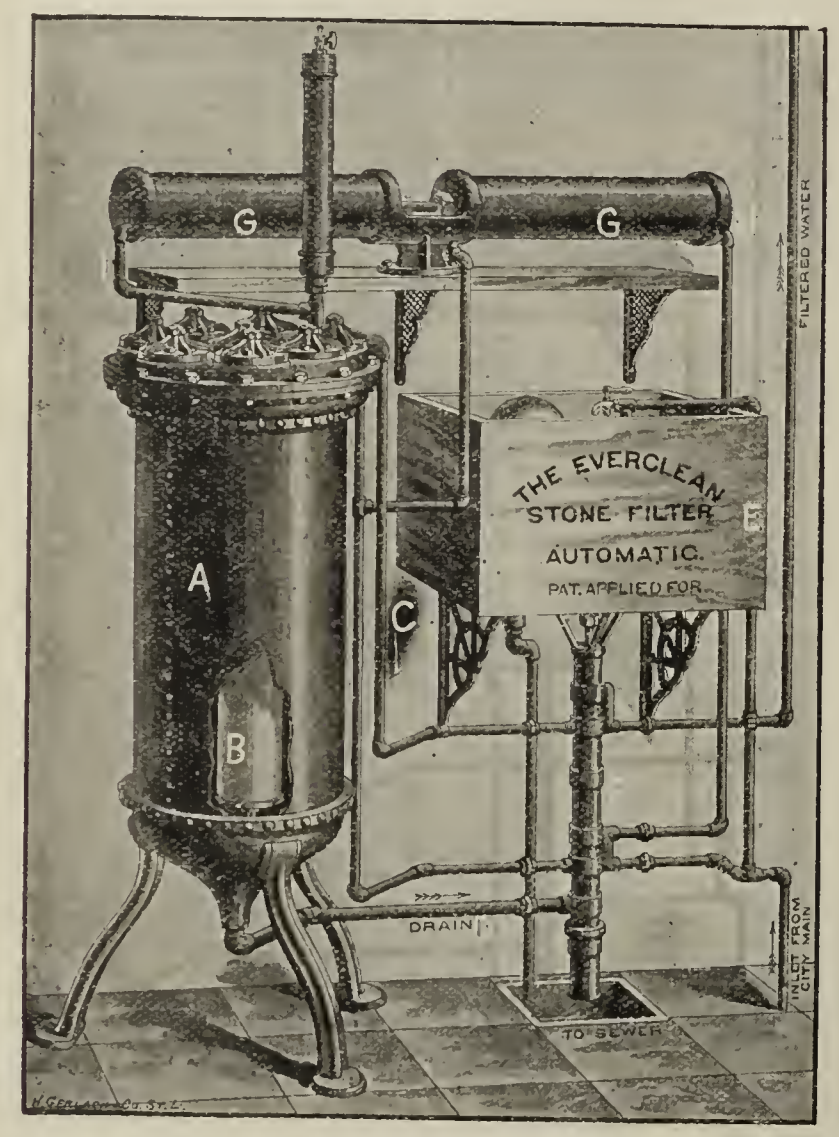
C. MACKINTOSH, who has had charge of the New York office of the McDaniel & Harvey Company for the past five years, severs his connection with them June 1. Mr. Mackintosh hereafter will be located in his own office at 61 Beekman street, New York, where he will transact a general commission business in Galvanized and Black Sheets and Spanish Tile for the Cuba trade, also handling Black Plates for tinning. We understand that Mr. Mackintosh will buy for a number of large concerns in New York and the New England States.

ALBANY NICKEL PLATING AND MANUFACTURING WORKS, C. H. Angus, proprietor, Albany, N. Y., call attention to their superior facilities for nickel and brass plating and finishing, bronzing, tinning and japanning. The plant is also equipped with all the most approved appliances for doing every kind of polishing, plating, finishing and coloring. Mr. Angus is also prepared to do all kinds of machine work, manufacturing or jobbing, and makes the following remarks concerning his machine shop, brass foundry, &c.: The machine shop is furnished with modern labor saving tools, insuring the rapid and accurate execution of work. Particular attention will be given to manufacturing Specialties and Light Machinery, and correspondence is solicited with those desiring to contract in this line. The plant includes a first-class Brass foundry, and Brass Castings of all kinds will be furnished on short notice, guaranteed smooth and sound, true to pattern and of the best metal. Brass Gates and Rails, Store and Showcase Fixtures, Brass and Nickel Signs of any style and design made promptly to order. Where articles are produced complete in one establishment, carefully arranged for easy and rapid production. under the personal supervision of its head, it is obvious that better and cheaper work will be secured than where they are produced by different concerns. My facilities enable me to offer this advantage to my patrons.

Four new steamships are to be built in England for employment in the Anglo Canadian mail service in connection with the Canadian Pacific line. The vessels will be 572 feet in length, 62 feet beam, with a depth of hold of 42 feet and a load draft of 30 feet, making them the deepest transatlantic vessels afloat. This draft of water is rendered possible by the fact that the English and Canadian harbors have deeper water than the harbor of New York. The freight carrying capacity of each of the new ships will be 3550 tons, in addition to a coal bunker capacity of 3000 tons. The engines are to be of 21,000 horsepower, working the vessels to a speed of 20 knots an hour.

The Everclean Stone Filter.

The Stifel-O'Neil Home Comfort Company, 904 Pine street, St. Louis, Mo., have brought out a new form of filter in which they use Missouri Tripoli as a filtering stone. The apparatus consists of a filter shell or chamber, A, into which city water under pressure is admitted. Suspended inside of this chamber are a number of cylindrical stones, B, bored through their axes and at the top connected with pipe C, which leads to the reservoir for filtered water. The city pressure forces the water through the pores of the stone into the central channel and up into the reservoir. This comprises the whole filtering process proper. To clean the filtering stones when they get coated with mud the action is reversed, and the filtered water driven back from the central channel through the pores. This forces the mud off, and by opening the pipe D at the bottom of the chamber the mud is carried off. When the cleansing is complete the mud pipe closes and the flow of water resumes its normal direction. This cleansing process is absolutely automatic and the reversal of the current can be made to take place as often as desired, once a day or once an hour. The reversal of the current is governed by a tank or cistern E with interior float and valves to regulate its periodical filling and discharge. The action of the float operates a series of cup leathers attached to a stem extending down through a brass sleeve, F, underneath the center of the tank. These cup leathers in turn serve to open and close the connection between the filter and the sewer outlet and at the same time to open a connection between the city mains and the horizontal double cylinder G G placed over the tank. When the tank fills with water the sewer connection as the filter opens allows some of the water in the filtering chamber to pass out. The city pressure enters the upper cylinder at H and drives forward a plunger by the action or which filtered water is forced from the opposite cylinder through the pipe I into and through the filtering stones. After this action the tank E empties automatically by siphonage, the discharge pipe D to the sewer closes and the filtering process is resumed through the cleaned stones as in the first instance. Upon the amount of water admitted to the tank will depend the frequency of the cleansing process.



The Everclean Stone Filter.

The increasing number of mysterious fires throughout the country, most of which might be traceable to defective insulation of electric light wires, have stirred up the insurance companies to stimulated action in this matter. An insurance journal records the fact that in the city of Hartford, Conn., the Board of Fire Underwriters have recently employed an expert to make a thorough inspection, with the result of finding 57 stores and offices in the business part of the city, including two large hotels, utterly unsafe from defects in insulation of the electric light wiring. Similar conditions, no doubt, prevail in other cities.

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Metal and Miscellaneous Prices.

CHICAGO, MAY 31, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14.14x20.	$5.65 @$5.75
IC, 14x20.90 ℔	@ 5.25
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC,10x14, 14x20.	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.62½
20 x 28	@ 11.25
IX. 20 x 28	@ 14.25
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
	Per box of 56 sheets.	
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20..$6.75
IX, 10 x 14, 12 x 12, 14 x 20.. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20..$7.00
IX, 10 x 14, 12 x 12, 14 x 20.. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.$9.25
Royal, extra. IC, 14 x 20 ..... 7.25
Merlon, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.50

Roofing Plates.

Palm, IC, 20 x 28 ..... @$11.50
Palm, IX, 20 x 28 ..... @ 14.00
Empire, IC, 20 x 28 ..... @12.00
Empire, IX, 20 x 28 ..... @15.00
Hickory, IC, 20 x 28 ..... @ 12.50
" IX, 20 x 28 ..... @ 15.50
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska IX, 20 x 28 ..... @ 17.75
Special, IC, 20 x 28 ..... @ 14.75
" IX, 20 x 28 ..... @ 17.25

Westmoreland:
IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.00

Elwood:
IC, 20 x 28 ..... $11 50

Kenwood:
IC, 20 x 28 ..... $11.50

Furmston:
IC, 20 x 28 ..... $11.00

Juno:
IC, 14 x 20 ..... $5.75
IC, 20 x 28 ..... 11.50

Illinois, Old Method:
IC, 20 x 28 ..... $17.00

E. L.:
IC, 20 x 28 ..... $12.50

Jessie:
IC, 20 x 28 ..... $12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 ..... 11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 ..... 19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28 ..... 22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20 ..... 7.50
" " IC, 20 x 28 ..... 12.50
" " IX, 20 x 28 ..... 15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia, IC, 14 x 20 (Stamped) 7.25
" IC, 20 x 28 (Stamped) 14.50
Maple, IC, 14 x 20 (Stamped) 6.75
" IC, 20 x 28 (Stamped) 18.50
Willow, IC, 14 x 20 ..... 6.50
" IC, 20 x 28 ..... 13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28 ..... 12.50
Globe, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
Miami, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ..... 12.00
" IX, 20 x 28 ..... 15.00
" (Redipped), IC, 20 x 28 ..... 17.00

Old Process:
IC, 14 x 20 ..... 9.25
IX, 14 x 20 ..... 11.25
IC, 20 x 28 ..... 18.50
IX, 20 x 28 ..... 22.50

H. B. L., Old Style:
IC, 14 x 20 ..... 7.75
IX, 14 x 20 ..... 9 25
IC, 20 x 28 ..... 15.50
IX, 20 x 28 ..... 18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ 2 3-10¢	3 1-10¢
17 to 20	℔ 2 4-10¢	3 2-10¢
21 to 24	℔ 2 5-10¢	3 3-10¢
25 and 26	℔ 2 6-10¢	3 4-10¢
27	℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Gennine Russia, all numbers.....13¢ net.
Patent Planished.....℔ A, 10½¢; B, 9½¢
dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata or first quality.....dis. 75@5%

Copper—

Ingot.

Lake.....10½¢ @ 11¢
Casting Brands.....10¢ @ 10¾¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Disconnt on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.33
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter ..... 4¢

Sheet Zinc—

600 ℔ casks ..... 4.50¢
800 ℔ casks ..... 4.70¢
Loose sheets ..... 4.80¢

Lead—

Soft Pig Lead ..... 4 ¢
Bar ..... 4½¢
Pipe ..... 5½¢, dis. 10¢
Block Tin Pipe ..... 35¢
Sheet ..... 6¢, dis. 10%

Solder—

½&½ ..... 13¢
Extra Wiping ..... 11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson ..... 13¢
Hallett's ..... 12¢

Wrought-Iron Pipe—

1¼ and under, Plain 60%
1¼ and under, Galv 50%
1½ and over, Plain 70%
1½ and over, Galv 57½%
Boiler Tubes, list Oct. 24, 1892 ..... 70&10%
Casing, list Nov. 16, 1892 ..... 62½%
Inserted Joints Casing, list Nov. 16, 1892 ..... 47½%
Steel Boiler Tubes 27½%
Cold Drawn Seamless Steel Tubing 60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive ..... dis 70&10%
Other sizes ..... dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted ..... 55¢
Austin's Corrugated 60%
Gordon & Gilbert's Corrugated 60%
Ritchie's (Galv. Iron only) Cor'd 60%
Ritchie's Spiral Lock Seam, Galv'd 55%
Austin's Spiral Ribbed Pipe 60%
Plain Adjustable Elbows 60%
James A. Miller Bros. (Galv'd Iron only) Corrugated 60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list 50%

Steel Roofing—

Perfection ..... $3.50 square
Climax ..... $3.35 square
The Lloyd Spanish Tiling ..... $4.50 square

Metallic Shingles—

Cushman's ..... $1.50 square
Merchant & Co.'s Spanish Tiles:
Copper, 14 oz ..... $36.00 square
Tin ..... $9.75@$14.25 square
Steel, painted ..... $9.00 square

Drain Pipe—*Tile.*

Discount from list 70%

Paints, Oils, &c.—

Deodorized Benzine ..... 7½@8 ¢
Iron Paint, Bright Red ..... ℔, 2 ¢
" " Brown ..... ℔, 1½¢
" " Purple ..... ℔, 2½¢
" Ground in oil, B. Red ℔, 6½¢
" Ground in oil, Red.. ℔, 6½¢
" Ground in oil, Brown ℔, 5½¢
" Ground in oil, Purple ℔, 6 ¢
Linseed Oil, Boiled, in bbls ..... 54¢
Linseed Oil, Raw, in bbls ..... 51¢
Mineral Paints ..... 2@4¢
Orange Mineral ..... 9½¢
Pure White Lead in Oil ..... 6@6½¢
Dry White Lead in bbls ..... 5½@5¾¢
Red Lead, American ..... 6@6½¢
Red Venetian, English, dry ..... $1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs ..... 7½¢
Sipe's Japan Oil, in bbls, ℔ gal ..... 34¢
Spirits Turpentine, in bbls., ℔ gal ..... 36¢
Asphaltum, Trinidad Refined, ℔ ton $45
Tarred Felt, 1 Ply, ℔ 100 ℔ $1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet $1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet $1.75
Roofing Pitch, ℔ bbl. of 300 ℔ $3.00

NEW YORK, JUNE 1, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:
Small lots ..... ℔, 05¢
100-℔ lots ..... ℔, 63¢
Ton lots ..... ℔, 60¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:
Small lots ..... ℔, 63¢
100-℔ lots ..... ℔, 60¢
Ton lots ..... ℔, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminuum), cast in ingots for remelting:
Small lots ..... ℔, 60¢
100-℔ lots ..... ℔, 55¢
Ton lots ..... ℔, 50¢

Antimony—

Cookson ..... ℔, 10½¢
Hallett's ..... ℔, 10 ¢

Brass—

Planished ..... net
Roll and Sheet ..... 25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.	
¾ in. up to 2 in.	$0.35	25 @ 30%
⅝-in. up to ¾-in.	.36	
½-in. up to ⅝-in.	.38	
⅜-in. up to ½-in	.41	
5-16-in. up to ⅜ in.	.48	
¼-in. up to 5-16-in.	.65	
3-16-in. up to ¼-in.	1.00	
⅛-in. up to 3-16-in.	1.50	
Smaller than ⅛-in.	Special	
3 in. and larger	Special	
2 in. to 3 in., to No. 19, inclusive,	.38	

Copper and Bronze Tubing—

8¢ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized 60%
Galvanized, Locked Joints 60%
Tin 60%

Spiral Riveted—

Galvanized 50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ℔, net

Ingot.

Lake ..... 10½¢
Ansonia Grade Arizona ..... 10 ¢
Ansonia Grade Casting ..... 9½¢
Planished ..... net
Sheet and Bolt ..... 15¢ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized ..... 60&10%
Lap or Slip Joint Terne 60%

Eave-Trough Mitres—

Lap or Slip Joint ..... list, net

Elbows—

Plain Adjustable—

Tin 70%
Galvanized 70%

Crimped Tubing—

Re-Tinned or Galvanized 35%

Stove-Pipe—

Buffalo Four-Piece.

4¼	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

20%

Elbows and Shoes—

Flat Crimp.

Tin 35%
Galvanized 35%

Corrugated.

Flat Crimp.

Galvanized 60%

Round or Square.

Tin 60%
Galvanized 60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔, 2.50	2.80¢
Nos. 17 to 21	℔, 2.60	2.90¢
Nos. 22 to 24	℔, 2.70	3.00¢
Nos. 25 and 26	℔, 2.80	3.10¢
Nos. 27	℔, 2.90	3.20¢
No. 28	℔, 3.00	3.30¢
American B. B.	℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment ..... ℔, 11½@12½¢
Patent Planished.....℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ 8½¢

Galvanized.

	B. B.	
Nos. 10 to 16		75@75&5%
Nos. 17 to 21		
Nos. 22 to 24		
Nos. 25 to 26		
No. 27		
No. 28		
No. 29		
No. 30		

Lead—

American Pig ..... 3¾¢@4¢
Bar ..... 4½¢
Pipe ..... 5¾¢, 20%
Tin Lined Pipe ..... 15¢, 20%
Block Tin Pipe ..... 37½¢, 20%
Sheet ..... 6½¢, 20%
Old Lead in exchange, 2¾¢ ℔.

Metal Exoanded—

Manufacturers' list No. 5.

Lathing 10%
Fencing, Painted Sheets 20%
Netting, Painted Sheets 20%
Door Mats, Galvanized 25%
Window Guards, Paneled 15%
Tree Guards, Paneled 15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil:	
Raw, ℔ gal	@ .50
Boiled	@ .53
Spirits Turpentine:	
In bbls	@ .30½
Putty:	
In barrels and ½ bbls	.01⅜ @ .01¾
In tubs	.01⅝ @ .01¾
In tin cans	.01⅞ @ .02¼
In bladders	.01⅞ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton ..... $30.00@$35.00
Asphaltum, Rock, ℔ ton $14.00
Coal Tar Felt, 1 Ply, ℔ ℔ ..... 2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.85
Roofing Pitch, ℔ bbl. $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₱ lb	₱ cub. foot.
Slag Wool, ordinary	1¼¢	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₱ bbl. $1.32@$1.33
Rosin, E. & F.....₱ bbl. $1.4 @$1.65
Rosin, G. & H.....₱ bbl. $1.80@$2.15
Rosin, I. & K.....₱ bbl. $2.40@$2 80
Rosin, M. & N.....₱ bbl $2.90@$3.10

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:

Best Bangor, ₱ sqr	$3.25@$4.50
Pen Argyle, ₱ sqr	3.70@ 4.00
Peach Bottom, ₱ sqr	4.75@ 5.60
No. 1 Chapman, ₱ sqr	3.90@ 4.25
Lehigh Slates, ₱ sqr	3.00@ 4.50

Vermont:

Sea Green, ₱ sqr	2.50@ 2.75
Purple, ₱ sqr	3.50@ 4.50
Unfading Green, ₱ sqr	3.50@ 4.00
Red, ₱ sqr	9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼.....13½@14¢
No. 1.....11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₱ lb.....4¢
Smaller quantities, ₱ lb.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₱ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.

No charge for package.

Bbls., about 500 lb, ₱ lb.....3½¢
½ bbls., about 300 lb, ₱ lb.....4¢
Kegs, about 110 lb, ₱ lb.....4¢
75¢ extra for keg.
Kegs, about 55 lb, ₱ lb.....4¢ } 5 % dis.

Yager's Soldering Salts.

¼-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₱ lb.....21½¢@22¢
Straits, pigs, ₱ lb.....21¢@21¼¢
Straits in bars, ₱ lb.....22¢@22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20	$7.00
Alderly, extra quality, IC, 14 x 20	6.37½
Allegheny, IC, 14 x 20	6.12
" IX, 14 x 20	6.38
Apollo Roofing, IC, 14 x 20	5.50
" " IX, 14 x 20	6.50
Atlantic, IC, 14 x 20	5.75
Bonus, Extra Coated, IC, 14 x 20	6.75
" " " IX, 14 x 20	8.25
Buckeye, IC, 14 x 20	7.00
" IX, 14 x 20	8.25
Chicago, IC, 20 x 28	11.50
Central, IC, 14 x 20	5.37½
Climax, IC, 14 x 20	5.50
Columbia, IC, 14 x 20	7.00
Dane, IC, 14 x 20	5.50
DeMilt's First New York, IC, 14 x 20.	5.75
" First New Jersey, IC, 14 x 20	5.50
" Mohawk, IC, 14 x 20	5.50
Dunlap's Double Dipped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
" Domestic, IC, 20 x 28	12.00
" " IX, 20 x 28	15.00
Empire, IC, 14 x 20	5.75
Extra Central, IC, 14 x 20	5.62½
Flag, IC, 14 x 20	5.25
Fort Pitt, IC, 20 x 28	11.00
Globe, IC, 14 x 20	5.75
Hamiltou's Best Redlpped, IC, 14x20	9.25
" " " IX, 14x20	10.75
Hickory (Resquared), IC, 14 x 20	6.12½
Juno, IC, 14 x 20	5.75
Keusington, IC, 14 x 20	6.75
" IX, 14 x 20	8.00
Knoxall, IC, 14 x 20	6.00
Laufman's Apollo (Resquared), IC, 14 x 20	8.12
Laufman's Apollo (Resquared), IX, 14 x 20	9.37
Leominster, Extra Coated, IC, 14x20	7.25
Lion (Stamped), IC, 14 x 20	6.25
Lula, Best Charcoal, IC, 20 x 28	12.50
" " " IX, 20 x 28	16.00
Manbattan, IC, 14 x 20	7.00
Maple, IC, 14 x 20	6.50
Merchant's Roofing (Resquared), IC, 14 x 20	8.25
McKinley, IC, 20 x 28	12.00
" IX, 20 x 28	15.00
Newcastle Real Old Method, IC, 14 x 20	9.50
" " " IX, 14x20, 11.50	
Newcastle Genuine Extra Coated, IC, 14x20,	8.75
" " " IX, 14x20,	9.75
Newcastle Sbenango, IC, 14x20	6.12½
" " IX, 14x20	7.62½
Neville, IC, 14 x 20	6.00
" IX, 14 x 20	7.25
N. F. Old Style, IC, 14 x 20	7.50
" " " IX, 14 x 20	9.00
Old Colony, IC, 14 x 20	8.00
Optimus, Best Redlpped, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.50
Osceola, Hand Coated, IC, 14 x 20	8.25
" " " IX, 14 x 20	9.75
Pacific, IC, 14 x 20	5.25
Palacio, IC, 14 x 20	5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20	8.00
Phœnix, IC, 14 x 20	5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20	9.25
Scott's Extra Coated (Resquared), IX, 14 x 20	10.75
Taylor Old Style (Resquared), IC, 14 x 20	9.25
Taylor Roofing, IC, 14 x 20	8.00
Thomson's Puritan, IC, 14 x 20	5.75
Tip Top, IC (Resquared), 14 x 20	6.62
" IX " 14 x 20	7.88
U. S. Monongahela, IC, 14 x 20	6.10
U. S. Redlpped, IC, 14 x 20	8.25
Venus, IC, 14 x 20	5.37½
Vigilant, IC, 14 x 20	5.50
Waldo Redipped, IC, 14 x 20	6.75
Westmoreland, IC, 14 x 20	6.25
Wilkinsburg Redipped, IC, 20 x 28.	16.00
" " IX, 20 x 28.	19.00
Willow, IC, 14 x 20	6.25

American Bright Plates—

Almond, IC, 14 x 20	$6.25
Brilliant (Tissue Packed), IC, 14x20.	9.00
Climax, IC, 14 x 20	6.00
" IX, 14 x 20	7.50
Florence, IC, 14x20	6.75
Hazel, IC, 14x20	5.80
Iowa, IC, 14 x 20	5.75
" IX, 14 x 20	7.00
Linden, IC, 14x20	6.50
Merchant's Dipped, IC, 14x20	11.00
Merion, IC, 14x20	6.75
Mint, IC, 14x20	6.00
Newcastle Russia, IC, 14 x 20	7.00
" " IX, 14 x 20	9.00
Newcastle Juniati, IC, 14 x 20	6.50
" " IX, 14 x 20	8.50
Newcastle Best Coke, IC, 14 x 20	6.00
" " IX, 14 x 20	7.25
Newcastle Coke, IC, 14 x 20	5.50
" " IX, 14 x 20	6.75
Palma Xtra, IC, 14x20	7.25
Phœnix, IC, 14x20	6.25
" IX, 14x20	7.75
Royal, Extra, IC, 14x20	7.00
U. S., IC, 14x20	7 25
Versailles, IC, 14 x 20	5.75
Youghiogheny, IC, 14 x 20	6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20	$7.50
20 x 28	15.00
IX, 14 x 20	8.75
20 x 28	17 50
Poutymister Grade, IC, 14 x 20	6 50
20 x 28	13.00
IX, 14 x 20	7.50
20 x 28	15.00
Worcester Grade, IC, 14 x 20	5.75
20 x 28	11.50
IX, 14 x 20	6 75
20 x 28	13.50
Dean Grade.—IC, 14 x 20	$5.37½
20 x 28	10.70
IX, 14 x 20	6.40
20 x 28	12.80
Abercarne Grade.—IC, 14 x 20	5.25
20 x 28	10.50
IX, 14 x 20	6.40
20 x 28	12.80

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₱ lb.

Melyn and Caland Grade.	IC, 10 x 14	$6.37½
" "	IC, 12 x 12	6.62½
" "	IC, 14 x 20	6.37½
" "	IC, 20 x 28	12.75
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.87½
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
" "	DC, 12½ x 17	5.50
" "	DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20	$5.25@$5.35
10x20	8.12½
20x28	11.00
IX, 10x14, 14x20	6.60
B. V. Grade.—IC, 10x14, 14x20	5.40

Imported Boiler Plates.—

IXX, 14x26..(112 sheets)	$13.35
IXX, 14x28..(112 sheets)	14.50
IXX, 14x31..(112 sheets)	16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz.... 18.00
Daisy Improved Pattern, ₱ doz.... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....50&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892.....70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 lb casks.....₱ lb 5¢
Per lb.....5½¢

It Is Reported—

Connecticut.

That E. Ward Willis' Hardware and furniture store, at VOLUNTOWN, was destroyed by fire on the 24th inst.

Illinois.

That Sullivan & Church's Hardware store, at WYOMING, was buglarized a short time since.

That William Lichtenberger, Hardware merchant of SAVANNA, has sold out his stock and fixtures to H. C. Rhodes. Mr. Lichtenberger has been engaged in the Hardware business for 35 years, and his retirement is due to a desire to give his entire attention to the development of an invention which he has perfected. He has conducted a Hardware store in SAVANNA for 17 years, and prior to that time was identified with the business at SHANNON and FREEPORT. Mr. Rhodes will conduct the business under the style of the Savanna Hardware Company.

That Charles Penticoff is building a new Hardware store at PEARL CITY.

That the Hardware stock of F. M. Swing, MASON CITY, has been purchased by Layman & Brother of Chicago, who will consolidate with Paul Enlows under the firm name of Enlows & Layman and conduct the business at the Swing stand.

That Blatt Bros.' new Hardware building at ELWOOD is nearly ready for occupancy.

That S. W. Dutton's Hardware store at TOWER HILL was burned to the ground on the 18th inst.

Indiana.

That fire on the 18th inst. damaged the hardware store of Wendling & Priest, ROACHDALE.

Iowa.

That O. F. Griffith of MOUNT PLEASANT has sold his stock of Hardware to Fernald & Co., composed of W. D. Fernald and N. D. Fernald, the former of MAPLETON and the latter of CHICAGO. Mr. Griffith has not yet decided as to his future course.

That W. H. Duke & Co. have purchased the Hardware stock of McKee & Gadd, DES MOINES.

Michigan.

That a new Hardware store has been opened at UNION CITY under the firm style of Spring & Conner.

That William Urie has sold his Hardware store at BURR OAK to Mr. Bordet.

That the Gunn Hardware Company of GRAND RAPIDS have disposed of their stock to Foster, Stevens & Co. The purchase includes the entire business of the former company, both wholesale and retail. The stock will be transferred as soon as possible to Foster, Stevens & Co.'s establishment, which is large enough to amply accommodate it. It is said that the purchase price was in the neighborhood of $125,000, and that the stock will inventory about $150,000. The Gunn Hardware Company were a stock company with a capital stock of $100,000, of which $85,000 was held by W. S. and W. A. Gunn. W. S. Gunn, the founder of the business, is a wealthy man, and his object in disposing of the stock is that he may be able to devote his whole time to other more lucrative enterprises in which he is interested.

That F. W. Moon, Hardware merchant at BELLEVILLE, has sold out his business to Dodge & Spaulding of DUNDEE, who will continue it on a larger scale.

That for the past three months the Hardware store at 89 Gratiot avenue, DETROIT, owned by Geo. J. Sexauer, has been systematically robbed. On the 21st inst., however, the thief was apprehended, being caught in the act of robbery. The miscreant proved to be a former employee of the store, access being obtained by means of a false key.

Minnesota.

That the West Side Hardware Company are a new concern at NORTHFIELD

That D. Q. Minar of WILLIAMSVILLE, N. Y., has removed his entire stock of Hardware, Tinware, &c., to ORIATT, Benzie County.

That Frank McKnight, dealer in Hardware, BUFFALO, has sold out his business.

That Miller & Nelson, Hardware merchants at WINDOM, have dissolved, Carl Nelson & Co. being successors.

That H. O. Shaw has opened a new Hardware store at SARGENT.

That W. T. Wilson & Co., Hardware merchants, WEST CONCORD, have been succeeded by C. W. Webb.

Nebraska.

That the Hardware store of C. M. Hayden, at WALLACE, was entered by burglars on May 12 and a large quantity of Cutlery, Whips, &c., taken.

New York.

That the WILLIAMSVILLE Hardware business of D. Q. Minar has been removed to ORIATT, Benzie County, Minn.

Pennsylvania.

That a handsome new front has been put in the Hardware store of Hoff & Bro., READING.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

BRASS FINISHER; a man thoroughly acquainted with high class brass finishing, such as fire place frames, fire sets, andirons, &c.; state lowest salary and full particulars. "Brass Finisher," office of *The Metal Worker*, 96-102 Reade street, New York City. June 2

PLUMBER and HOT WATER FITTER; steady job to first-class man. Thompson & Morrison, Amherst, N. S. June 2

A TINNER at once, for roofing, spouting, iron ware and general work in a town of 4000 inhabitants; man who is single and has had from six to ten years' experience. Lock Box 241, Garrett, Ind. June 2

A first-class man who thoroughly understands CORNICE, BAY WINDOW and SKYLIGHT WORK and TIN ROOFING; steady job to sober and reliable party; address in writing only with references; state salary expected. "T. W. D.," 1004 Garden street, Hoboken, N. J. June 2

A sober, reliable man can obtain a situation in a shop now tinning malleable and cast iron; one who understands running a grease pot preferred and capable of turning out first-class work. Frank Baldwin, 33 South street, New York City. May 26

Good STOVE SALESMAN for Iowa and Wisconsin to sell a large line on commission. "Commission," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 26

A first-class PLUMBER who can do steam and hot water fitting. Geo. A. Anthoine, 24 Alfred street, Biddeford, Maine. May 26

SUPERINTENDENT for stove foundry running 150 molders; must be first-class manager, with good ideas and thorough practical knowledge of all the details of the business, capable of taking full charge; address, giving experience, references, age and salary expected, "X. Y.," No. 526, office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

A first-class man who thoroughly understands TIN and SHEET IRON WORK and has some knowledge of furnace work and plumbing; must be temperate; only those competent and able to furnish good recommendations need apply; steady work to the right man; give age. Adams Hardware & Furniture Company, Lamar, Mo. May 26

An ASSISTANT to a FOREMAN in a cornice shop in Philadelphia, Pa.; an active, industrious man with experience; also first-class SHOP WORKERS on copper cornice work; give references. "Copper," office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

SITUATIONS WANTED.

TINSMITH capable of taking charge of a shop, a master of the trade—can do pipe fitting, pump work and all work that comes to a country shop; satisfactory reference; New York or New England preferred. "J. D. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. June 2

By a strictly moral young man where he can finish learning the tinners' trade; one year's experience; best of references; have also had experience in clerking. "H. K.," P. O. Box 366, Delavan, Wis. June 2

By a PLUMBER, ten years' experience. Arthur Wickers, 1466 Third avenue, New York City. June 2

By a first-class PLUMBER. N. Charbunneau, 1609 First avenue, New York City. June 2

As FOREMAN or SUPERINTENDENT in a cornice and roofing shop; a first-class cutter and draftsman; also understands estimating on all kinds of cornice, tin and sheet iron work; have 20 years' experience; can give best of references. "Cutter," No. 62, office of *The Metal Worker*, 96-102 Reade street, New York City. June 2

By a PLUMBER; five years' experience. Andrew Miller, 113 North College street, Schenectady, N. Y. June 2

By a first-class MECHANIC; ten years' experience at furnace work; roofing, cornice and general outside work; also gas and steam fitting and pump work; some knowledge of plumbing; experienced in the manufacture of all kinds of pieced tinware; steady, sober, honest and trustworthy; best of references; will go to any part of the United States; wages moderate; steady work desired. Geo. H. Stewart, Brownsville, Tenn. June 2

By a STEAM and HOT WATER FITTER; 12 years' practical experience; two years and a half on the absorption system of refrigerating; sober and industrious; first-class references. E. J. Taylor, 184 Franklin street, Brooklyn, N. Y. June 2

As FOREMAN, by a japanner on plain and ornamental work; first-class references; wages, $21 a week; would like to make a contract for one year. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. June 2

As FOREMAN in an iron foundry; five years' experience; best of references. John Lyons, 745 River street, Troy, N. Y. June 2

By an all around TIN and SHEET IRON WORKER, with some experience in piping and plumbing; city or country; good references. C. E. Campbell, Haddonfield, N. J. June 2

As NICKEL PLATER in first-class establishment, by first-class workman, either brass or iron; an all round workman; can fit up and repair machinery; also polisher and buffer. Thos. A. Anderson, 61 Elm street, Cortland, N. Y. June 2

A first-class PLUMBER, in country; 15 years' experience in New York City. James McDermott, 1089 First avenue, New York City. June 2

TRAVELING SALESMAN having trade in house furnishing goods, &c., in all States east of Kansas, desires position for months July, August and September; best references. E. W. Joyce, 169 William street, New York city. June 2

Two first-class PLUMBERS, A No. 1 men, desire to leave the city and can furnish best city reference; can do steam and gas fitting. A. Gillispie, 135 West 101st street, New York, City. May 26

Steady position desired by a young man, 25 years of age, who has had five years' experience as a first-class iron stove pattern filer; steady, sober workman. Frank Hamburger, 958 Jefferson street, Buffalo, N. Y. May 26

By a good TINSMITH who understands plumbing, gas fitting, roofing and all inside and outside work; country preferred. H. Rose, care L. Bloom, 180 West Main street, Norwich, Coun. May 26

By a reliable young man as PLUMBER or ASSISTANT; recently graduated from the New York Trade School; can furnish the best of reference from former employers; also understands lead burning. "B. C. B.," Greene, Chenango Co., N. Y. May 26

First-class PLUMBER wants position anywhere; 12 years' experience. Jo. Rielly, 504 West Twenty-eighth street, New York City. May 26

By a TIN and SHEET IRON WORKER; 15 years' experience. S. Lissick, 119 Suffolk street, New York City. May 26

CORNICE, SKYLIGHTS and ROOFING; a young man having had three years' experience in the office of a large concern in New York City, also superintending outside work, desires permanent position in similar capacity; competent to keep books; position acceptable either in New York City or out of town; references and security at your disposal. "Advertiser," 172 Seventh avenue, New York City. May 26

As SALESMAN or TINNER with hardware, plumbing, tinning or stove house; good bookkeeper; moderate salary; references; can do any shop work. "L. L.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

By a TINSMITH and ROOFER, at inside and outside work. H. Thron, 110 Orchard street, New York City. May 26

By a STEAM and HOT WATER FITTER; first-class workman; sober. John S. Keefe, 316 West Thirty-fifth street, New York City. May 26

By a STEAM FITTER. Cornelius Cornell, 31½ Macdougal street, New York City. May 26

By a PLUMBER with three years' experience; good knowledge of steam and gas fitting; strictly temperate; town or city. Richard Ingalls, 106 Congress street, Lowell, Mass. May 26

By a first-class PLUMBER; ten years' experience at the trade; city or country. "J. G.," care of Miss Kennedy, 1221 Third avenue, New York City. May 26

By a TINSMITH and ROOFER; good knowledge of plumbing; can do all kinds of jobbing and outside work; city or country. "F. M.," Box 112, Thomaston, L. I., N. Y. May 26

By a competent man with 25 years' experience at tin, sheet iron and copper work, hot air furnaces, steam and hot water heating and plumbing; can estimate on work; have had charge of a shop; best of references; wages moderate. H. M. Hoffman, 14 Sixth street, Minneapolis, Minn. May 26

As STOVE MOUNTER, by an A1 man of 20 years' experience; all branches of the business; no objection to going South or West. S. M. Newkirk, 9 Depot street, Middletown, N. Y. May 26

On the road by a thoroughly experienced IRON, STOVE and HARDWARE SALESMAN, with over 12 years' experience; west of Mississippi River; wide acquaintance with trade to Pacific Coast; age 33; best references. "W. S. B.," 610 E. Sixth street, Leadville, Col. May 26

As FOUNDRY FOREMAN or SUPERINTENDENT; thoroughly competent, with 15 years' experience; can furnish very best A1 references. "Foundry Foreman," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 26

As TINSMITH and ROOFER by a young German, 25 years of age; willing to work; can do inside and outside work; with or without board; 12 years' experience. Jos. Dangas, care of Jacob Maak, 1213 First avenue, New York City. May 26

By June, by a FOREMAN and CULLER of seven years' experience as such; last five years with one firm; has had extended experience in contracting, getting out and putting up cornice, skylights and other sheet metal work; has had 21 years' experience all told at the trade; is married and strictly sober and wants a position where ability and worth will be appreciated. "F. M. W.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. May 26

By a practical CORNICE and SKYLIGHT MAKER: first-class cutter; thoroughly understands all kinds of sheet metal work; capable of taking charge of work inside and outside; wages moderate; best of references; New York or Brooklyn preferred. "Cornice Maker," office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

By a TRAVELING MAN of 12 years' experience, visiting the stove, tinware and hardware trade in Eastern Pennsylvania; can furnish first-class reference as to character, ability, &c. "Penn.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 26

By a first-class TIN and SHEET IRON WORKER; capable of doing roofing and general jobbing; inside and outside worker; 15 years' experience; steady work desired; $15 a week; married; sober. A. Siegel, 169 East Ninety-sixth street, New York City. May 26

By a first-class TIN and SHEET IRON WORKER; good general jobber; fair steam and hot water fitter and plumber; well up in heaters and ranges; 30 years' experience; sober and reliable; A1 reference. "J. O. P.," 2396 Third avenue, Room 131, New York City. May 26

By a practical, all around mechanic in all branches of the Hardware business, competent to design and make metal patterns, dies tools, jigs, &c.; nine years as foreman in the above branches; good references. "Mechanic," P. O. Box 150, Harvy, Ill. May 19

A practical BRASS MOLDER, 25 years' experience on steam and water work, plumbers' supplies and general jobbing, desires a position to take charge of shop running from five to ten molders; can break in help; sober, steady man; good reference; location no object. "Brass Molder," 68 Beech street Paterson, N. J. May 19

Steady work desired by a good TINSMITH at furnace work, roofing and general jobbing; 20 years' experience; married. 11 South street, Troy, N. Y. May 19

As FOREMAN in tin and sheet iron works by thoroughly competent man; can manage any number of men judiciously. Charles Harvey, 251 Fourteenth street, Buffalo, N. Y. May 19

By a competent man of 12 years' experience in the STEEL RANGE business, in all its branches. Harry Hellman, 516 Johnson street, Covington, Ky. May 19

By a good TINNER and GENERAL JOBBER at inside and outside work; steady and temperate; willing to work for moderate salary; city or country. S. Klinberg, 258 Delancey street, New York City. May 19

By a thoroughly competent TINSMITH; experienced in pipe, jobbing, pump work, hot water and steam heaters; capable of taking management of shop; steady, reliable and can come well recommended; at liberty June 10, or can come sooner if imperative. J. D. Francis, Bridgeport, Conn. May 19

By a young man as SHEET IRON WORKER ROOFER and JOBBER; sober; wages moderate; six years' experience. "T. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. May 19

By a practical PLUMBER of 18 years' experience, on new or overhauling work, to take charge or work journeywork; first-class workman, city or country. "Emmett," care of E. Moran, 181 East 111th street, New York City. May 19

By a CORNICE CUTTER; can furnish brake. "Cornice Cutter," care of Harter House, Anderson, Ind. May 19

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A large commission to handle the diamond Extension Stove Back. Aluminum Model furnished. Sells nicely as a side line. Any part of the United States. One dozen weighs 100 pounds. Apply to

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Stove and Tin Store in growing town. A good opportunity for practical man. For reason address

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One No. 5 Sturtevant Fan and Counter Shaft, with 38 feet of 11½-inch Galvanized Iron Blow Pipe. Address

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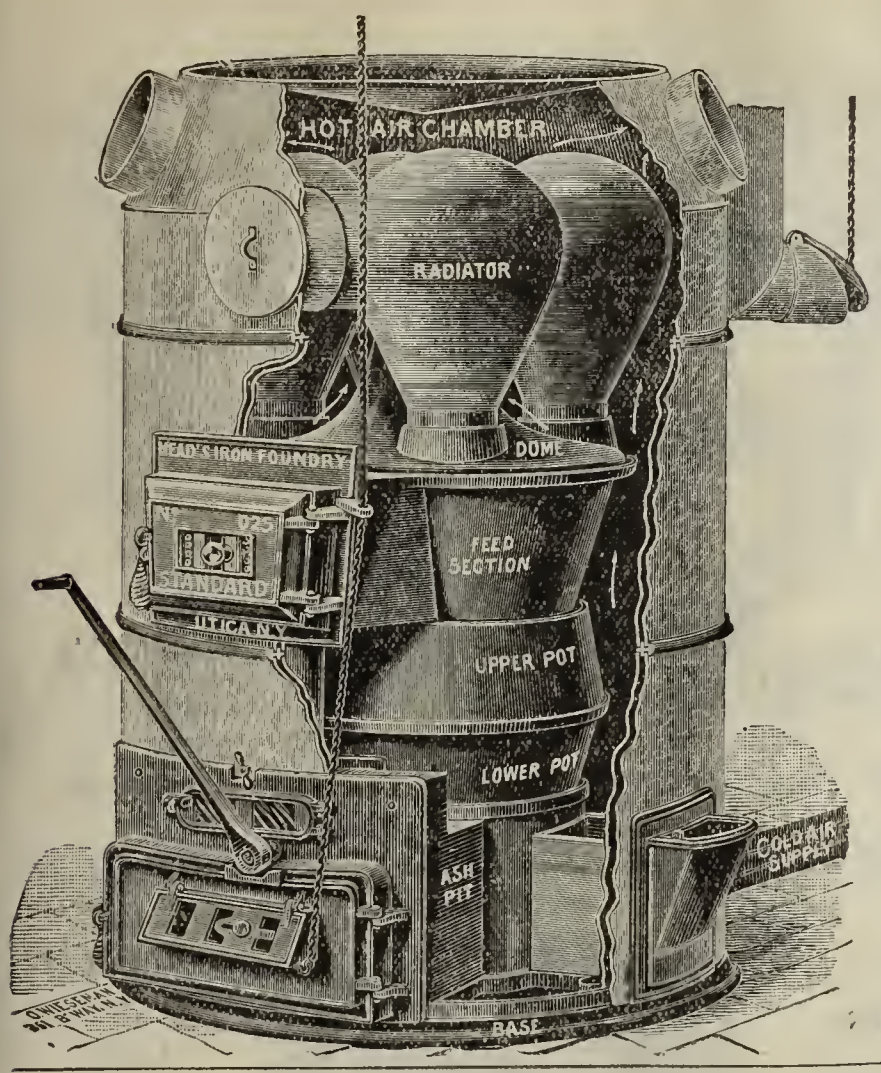
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on heating contracts are often wasted in trying to make an inferior furnace satisfy the purchaser.

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A Practical Treatise on the Art and Science of Pattern Cutting as Applied to Sheet Metal Work. Seventh edition. Illustrated with 520 line engravings. 242 pages, 12½ x 10 inches. Printed on heavy paper. Substantially bound in cloth.....$5.00

ITS PRINCIPAL CONTENTS are as follows: 1. *Definitions and Technicalities.* 2. *Drawing Tools and Materials.* 3. *Geometrical Problems.* 4. *Art and Science of Pattern Cutting.* 5. *Pattern Problems.* Each demonstration is complete in itself. The list of problems embraces almost everything of common occurrence in the sheet-metal trades. The tinner will find in this book what he requires without the necessity of studying the cornice problems. The cornice maker will find everything—from a simple miter to the most complex problems—so arranged as to meet his requirements without having to go over portions in which he is not interested. The apprentice and student will find the entire subject presented in such a manner as will facilitate systematic study. A carefully prepared index accompanies the work.

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More Than His Share.

In the summer of 1864, says a writer in the *Southern Bivouac*, several wounded officers and two or three privates were going up the valley of Virginia. A rain came on and all hands took shelter for the night in a school house.

It happened in the course of the night a skunk found its way under the floor, and by and by announced its presence after its well-known effective manner.

The officers all waked up, but being gentlemen and each supposing that the others were still asleep, they all kept silent. At last one of the privates, a German, could restrain himself no longer.

"My! my!" he exclaimed. "Dish ish too bad! Dey shleeps, und I wakes, und I ish got to shmell it all!"

That broke the charm, and officers and privates burst into peals of laughter.

— CASES of bad syntax, probably bogus and invented to raise a laugh, like the "grand piano for sale suitable for a young lady with mahogany legs," or "special drawing room for ladies 35 feet wide," are among the stock newspaper "properties;" but one or two recent ones, vouched for in *Printers' Ink* as genuine, are quite equal to the best fiction, and rather give credit to the genuineness of the others. "Girl wanted to mind baby about 14 years old," raises a suspicion that 24 years was the real age of the infant. "Cork soles for men and boys with flexible bottoms" need not miss any customers by the restriction. A Philadelphia shoemaker advertised "Ladies, while they last, $4," which certainly gives a false idea both of the price and easy obtainability of Philadelphia ladies. "House to let in an unapproachable locality," naturally killed the renting of the house; and "Families Supplied" is a bait to nobody, even the man who can't supply one for himself never wanting any help about it.

— CLEVELAND *Plain Dealer:* "There must necessarily be," said the coal dealer, "a little slack in the weight."

Awake to His Peril.

"I tell you, William," said a Columbia County sheriff to a farmer whom he was endeavoring to have meet a cutthroat note, "you'll have to hustle and pay up or we will put you in limbo."

The old farmer, after his departure, was puzzled to know what limbo meant, and sought the country squire. It was very dark for the justice, but after diligently searching "Purden's Digest" for half an hour he exclaimed: "I've got it, Bill! Limbo means the outskirts of hell."

"Gee whiz!" snorted the old man, looking frightened to death. "Can it be possible that a measly Columbia County deputy sheriff has the power to put a fellow in a place like that? I guess I'd bet ter settle up."— *Wilkesbarre Newsdealer.*

Nonsense Verses.

[*From the Philadelphia Press.*]

The night was drear, you scarce could hear
  The solemn codfish bawl;
The owl, somehow forgot to howl,
  The calf had lost its caul.

"'Tis growing cold, the stove is coaled,"
  The ice man shrieked in glee.
"I'll get some ice, 'twill boil my pot,
  Some mice," said the Chinee.

The saw horse saw the saw fish saw
  The ice, and said: "That's gneiss!"
The ice man sought to cure his eyes,
  He said: "My niece is nice.

I'll take her to a town that's Nice,
  Mine ice is wasting here,
I'll get my eyesight back again,
  While here I can only hear."

He seas the sees, and seizes hold
  The rope, and down the hold
He bowled and knocked the captain down,
  Who cried: "You're over bowled!"

"This is the equinox," he cried,
  "It knocks us equally.
'Tis noxious both to man and beast,
  Such sees the seasons see."

"Let me alone," the ice man groaned,
  "I've grown afraid to pun;"
"Let you alone?" the captain cried,
  "'Tis done, but I shall done."

"This bounding billow's bound to bear,
  The passengers to land;
Abounding in the wealth they need,
  This bill owe calls for 'sand.'

"The francs we'll frankly need in France;
  Stranded we reach her straud,
Her banks can't check our cash advance;
  They will not ban our land."

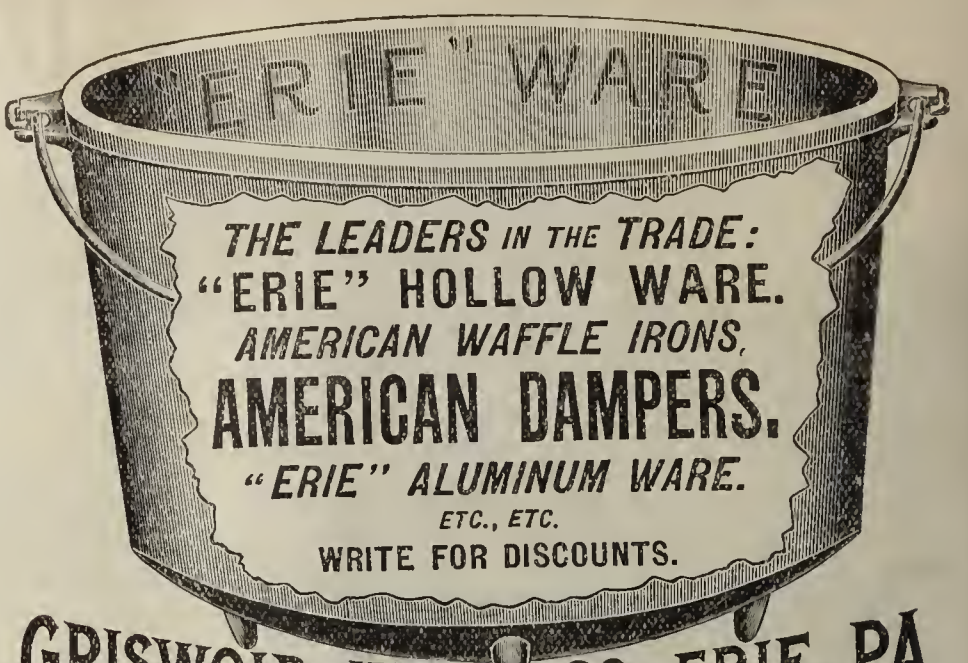
With health and eyesight both restored,
  The niece and ice man too,
Will hie them back from Nice to ice
  'Tis due they thus should do.

There is a story, with a moral, told by a contemporary which will bear repetition. Two travelers were conversing. One was selling stacks of goods, while the other was being left all along the line. The unsuccessful man had put the query to the other: "How do you sell so many goods, while it seems I can't make a sale?" "Well," answered the elder, "there is a secret about it. You are just starting out, and, to help you along, I'll give you this pointer, but you must keep it secret." "Sure," replied the younger, beaming with pleasant anticipation, "how do you manage to be so successful?" "I always make it a point," replied the elder, "to wear out the soles of my shoes instead of the seat of my trousers."

— "Oh, mamma, look here," said a little visitor in the country who had got her eyes on a potato bug for the first time.

"What is it, dear?"

"A funny kind of fly with a tennis blazer."—*Vogue.*

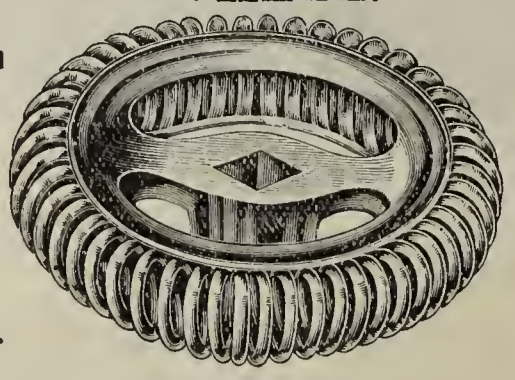


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Diameter,	1½,	1¾.	2	2¼,	2½.	2¾,	3,	3½,	4 inch.
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SHOULD BE USED ON EVERY

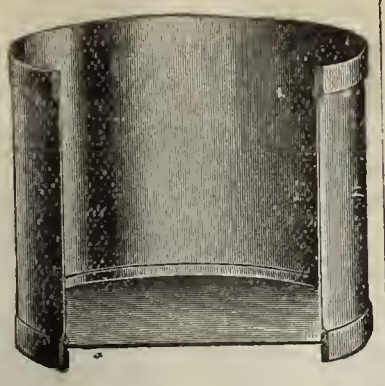
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WROUGHT STEEL GRAIN MEASURES.

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Capacity, ¼ peck, ½ peck, 1 peck, 2 pecks.

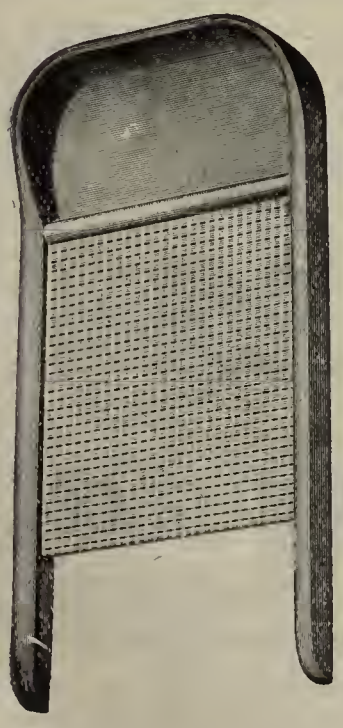
Nested or packed in single sizes.

This measure is without doubt the best article of the kind on the market. The bottom is fastened mechanically in the slot formed by the peculiar method of folding the bottom, which is clearly shown in the cut above. It is further strengthened by the band folded at the top.

It is made completely of solid steel and is warranted to outlast any other measure. Manufactured only by

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Is a Zinc Board made from best quality No. 6 Zinc, the heaviest and strongest Zinc in use for Washboards.

CRIMP—The Crimp is our Improved Deep Globe acknowledged far superior to any now in use on other boards.

OFFERS—absolute protection from water at sides as well as the top of the soap board.

WHY?—Because being made of one piece which is bent thin and broad at the sides and top of soap board where all splashing occurs, it is impossible in washing to splash over it.

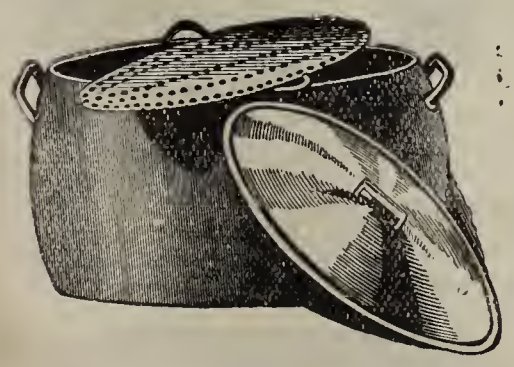
CONSTRUCTION—The Board in point of construction excels anything of its kind ever produced. Its lines present a symmetry and regularity pleasing to the eye, and in point of strength is unquestionably superior to any.

SALES—Where these are offered for sale competing boards are not "in it."

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Blue Enamel Finish Outside. Tinned or Enameled Inside. Strainer for Lifting Out. Side Handles.

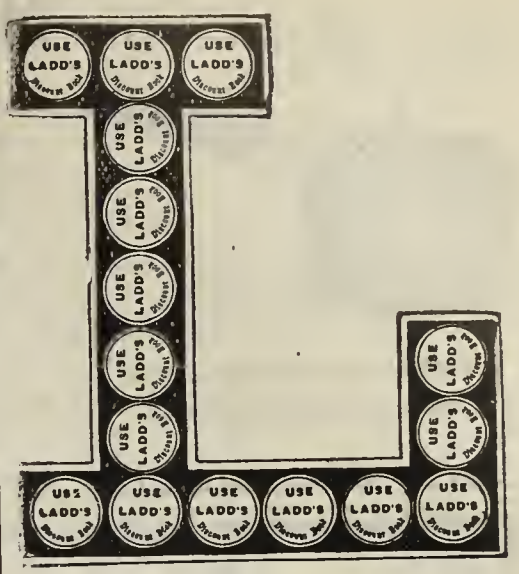
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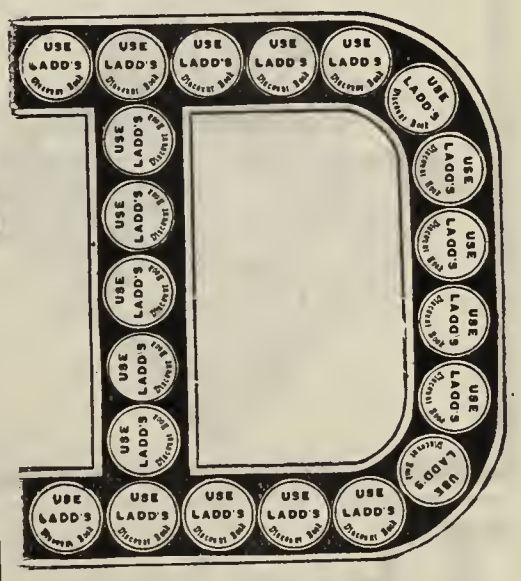
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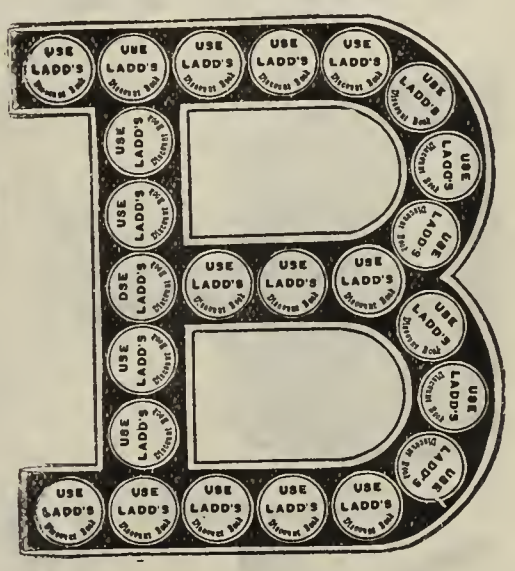
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SPECIAL GOODS TO ORDER.







ACCURATE.

RAPID,

CONVENIENT,

PRACTICAL.

PRICE, THREE DOLLARS.

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"PURITAN"
COOKERS, COFFEE POTS AND OTHER SPECIALTIES.



Cooks Quicker than any other Porcelain Rice Boiler made.

"NEVER-BREAK"

Wrought Steel Spiders, Griddles, Kettles, Stew Pans, Maslins, Scotch Bowls, Etc.



Flat Bottom Kettles, Four Sizes. Polished, Tinned AND Porcelained.

"EXCELSIOR"
ROASTING AND BAKING PAN.
Planished and Plain Steel.



THE BRONSON SUPPLY CO., New York and Cleveland.



St. Louis Stamping Co.,

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Granite Ironware and Dripping Pans.

Fine Black and Galvanized Sheet Iron.

TIN AND TERNE PLATES.

Branch Houses: NEW YORK. CHICAGO. BOSTON.

They're All the Best (?)



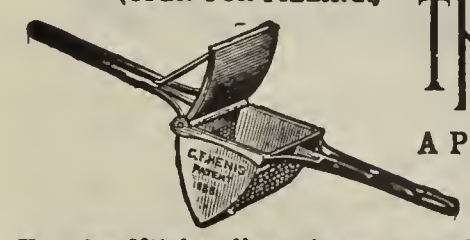
But why don't they sell like the Hunter? The reason is obvious; none of them have stood the test like this, the Pioneer of them all and which to-day still stands at the head Send in your specifications now.

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(OPEN FOR FILLING.)



No other Kitchen Utensil can be used for so many purposes.



(HOW IT OPERATES.)

THE HENIS Fruit Press and Vegetable Strainer.

A Potato Masher, A Fruit Press, A Jelly Press, A Disintegrater, A Colander, and A Vegetable Strainer,

COMBINED IN ONE

Small, Strong, Light, Cheap, Handy Utensil

ALWAYS READY. EASILY CLEANED.

A HOUSEHOLD NECESSITY

YOUR DEALER HAS IT.

—MANUFACTURED BY—

WILLIAM VOGEL & BROS.

BROOKLYN, N. Y.

THE TRIUMPH COOKER,
WITH LOCK COVER.



STEAMLESS, ODORLESS AND NON-BOIL-OVER.
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.
A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.

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HARTFORD, CONN.

— FIGG: "Goodman is dead. He has led a most beautiful and correct life. Everybody praises him."

Fogg: "But, confound him, he trumped my ace once when we were playing partners at whist."—*Boston Transcript.*

— "I THOUGHT you said you were going to bring a friend home to dinner with you," said Mrs. Chugwater.

"He couldn't come, Samantha," replied Mr. Chugwater, as he sat down with great satisfaction to the first good dinner he had had the chance to attack for a long time.—*Chicago Inter Ocean.*

GEUDER & PAESCHKE MANUFACTURING CO.,
Manufacturers of
TINWARE AND SHEET METAL GOODS.

Made of IX Tin.



Patented Apr. 26, '92.
Patented Nov. 21, '92.
Patent Pending.

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And Prices on

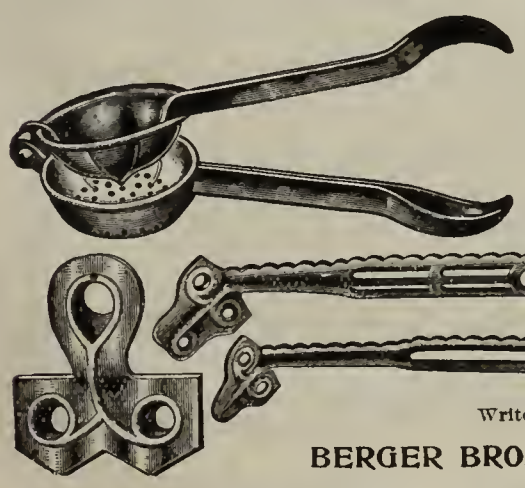
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WE MAKE the strongest, most substantial and most handsomely ornamented Flour Bin on the market. It is supplied with our patent **detachable shield,** which keeps the weight off and the crank from clogging. It also has our patented sleeve, which protects the flour from coming in contact with the iron crank. It has many other valuable features. We are daily receiving inquiries from consumers in places where our bins are not handled by dealers. You can have this trade if you want it, by carrying a small stock of our bins. With orders for one dozen or over we furnish 500 of our handsome booklets with your name and address, thus giving you some of the best free advertising you ever had. Very respectfully,

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Do you make Lemonade?

IF SO,

You want our SQUEEZER.

Positively the best. Suitable for any size lemon.

We also make the finest

Sauce Pan Handles

in the country. Beautiful designs; all sizes; large stock.

Write for Samples, Catalogue and Prices.

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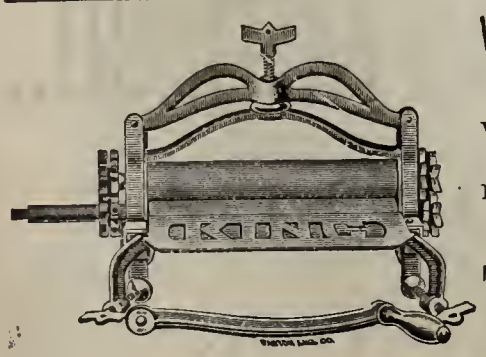
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—MANUFACTURERS OF—

ALL KINDS OF TINWARE and SHEET METAL GOODS.

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104 and 106 John St.

FACTORY,
103 to 119 N. 3d. St., Brooklyn. E. D., N. Y



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

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New York Office, 107 Chambers St., John T. Ryan, Mgr.



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GUARANTEED TO BE

THE BEST IN THE WORLD!

OVER 50 DIFFERENT STYLES AND SIZES, IN HARD AND SOFT WOOD,

At LOWEST PRICES EVER KNOWN.

If your dealer does not have them, Send for Illustrated Circular and Price-List, to

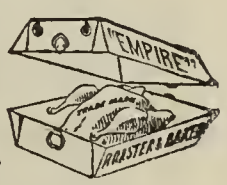
JOS. W. WAYNE,
MANUFACTURER,
124 MAIN STREET, CINCINNATI, O.

NEW YORK ELBOW CO.,

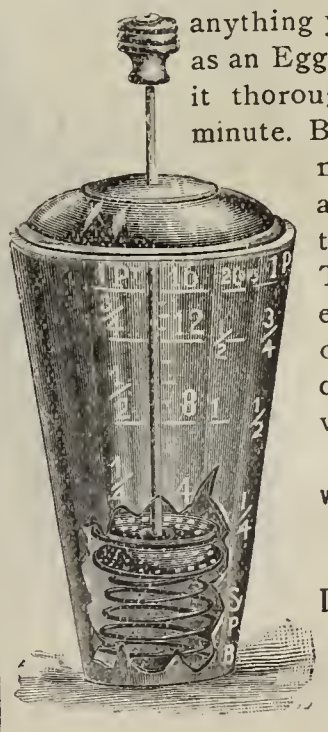
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Makers of **Elbows** AND **Roasters.**



It Beats



anything you ever saw as an Egg Beater, does it thoroughly in one minute. Beats, strains, measures and a host of other things it does. The best seller ever introduced. Is clean and very cheap.

Write for Prices in Lots.

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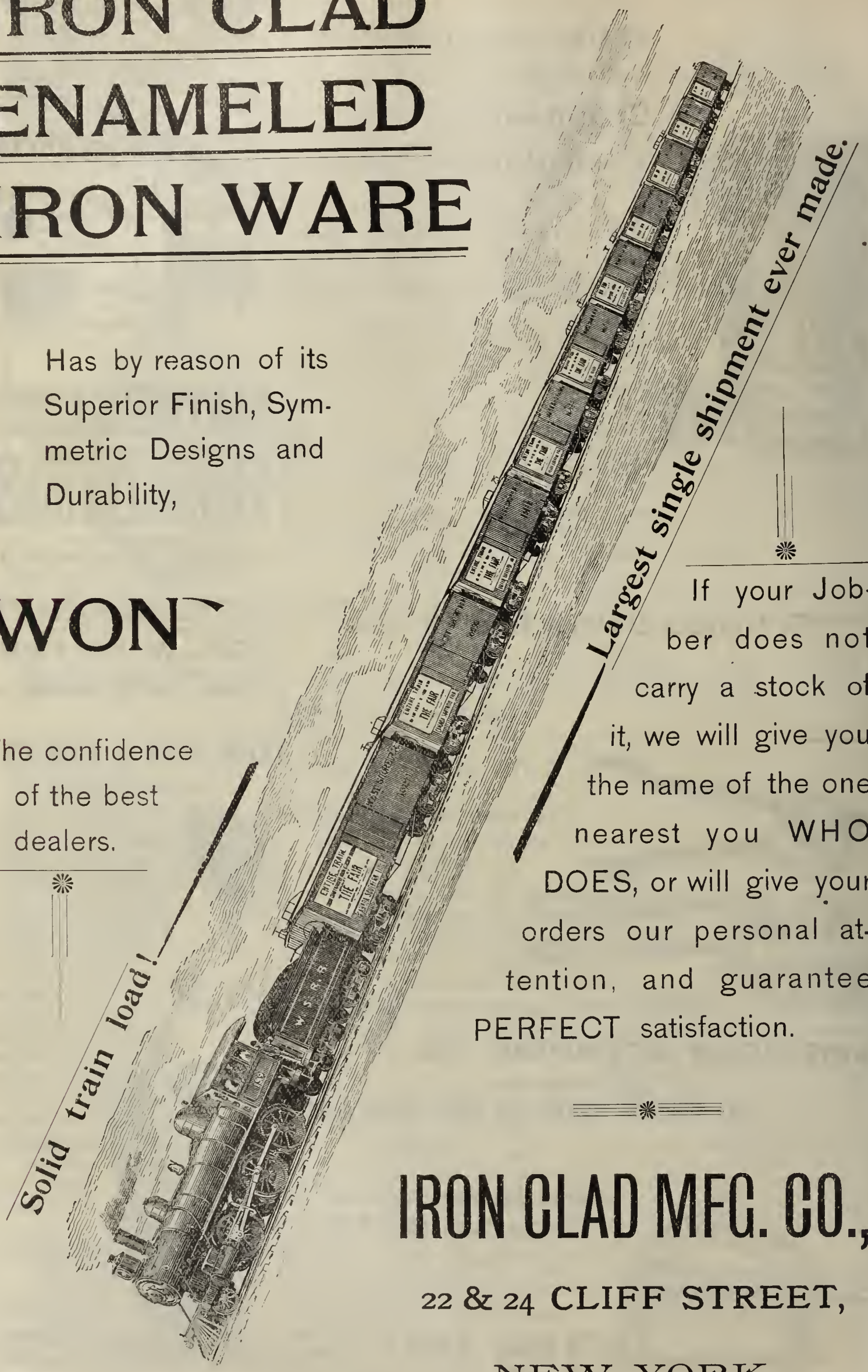
Toledo, Ohio

IRON CLAD ENAMELED IRON WARE

Has by reason of its Superior Finish, Symmetric Designs and Durability,

WON

The confidence of the best dealers.



If your Jobber does not carry a stock of it, we will give you the name of the one nearest you WHO DOES, or will give your orders our personal attention, and guarantee PERFECT satisfaction.

IRON CLAD MFG. CO.,

22 & 24 CLIFF STREET,

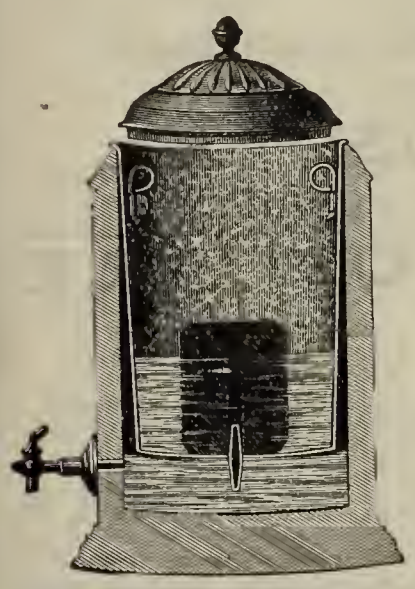
NEW YORK.

The "CENTRAL" Filter=Cooler.

——WITHIN REACH OF EVERY FAMILY.——

CLARIFIES AND PURIFIES THOROUGHLY—NO TASTE OR SMELL—ONLY PURE CARBONS USED—REMOVABLE FOR CLEANING.

The "CENTRAL" Filter=Cooler is an adaptation of a device long in use abroad, especially in France, Germany and England. Heretofore applied only to expensive constructions, it is now brought within reach of every household. The cooler, complete, costs but little more than the ordinary article, while the filtering device is of the very highest quality. The carbons are pure and easily detached for cleaning; the filtering cylinders are made to fit **all our regular series of Coolers.** An important feature of the Filter-Cooler is the **separation** of the **ice** from the **filtered water.**



Sectional View of Cooler Showing Filter in Position.

Prices and Sizes—Cooler-Filters Complete.

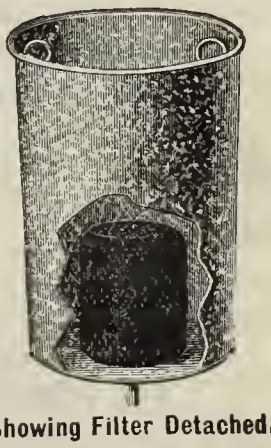
GALLONS—	2	3	4	6	8	10	14
Japanned or Crystal, each,	$4.50	5.00	5.75	7.00	8.50	10.50	14.50
Extra Heavy—Japanned, with side handles, each,	$6.00	6.50	7.50	8.75	9.75	12.00	16.50

Filter Cylinders Only, Fitted with Carbons.

GALLONS—	2	3	4	6	8	10	14
Each,	$2.50	2.75	3.00	3.50	4.00	4.50	5.50

THE CENTRAL STAMPING CO.

23 and 25 CLIFF STREET, - - NEW YORK.



Showing Filter Detached.

KIECKHEFER BROTHERS COMPANY,



PROPRIETORS OF THE

Milwaukee Stamping Works,

MANUFACTURERS OF

PLAIN, RETINNED, GALVANIZED, JAPANNED AND ENAMELED PIECED AND STAMPED

Tinware and Sheet-Iron Goods.

St. Paul Ave., Ninth and Tenth Sts., **MILWAUKEE, WIS.**

SEND FOR CATALOGUE AND PRICES.



The "JEWEL"

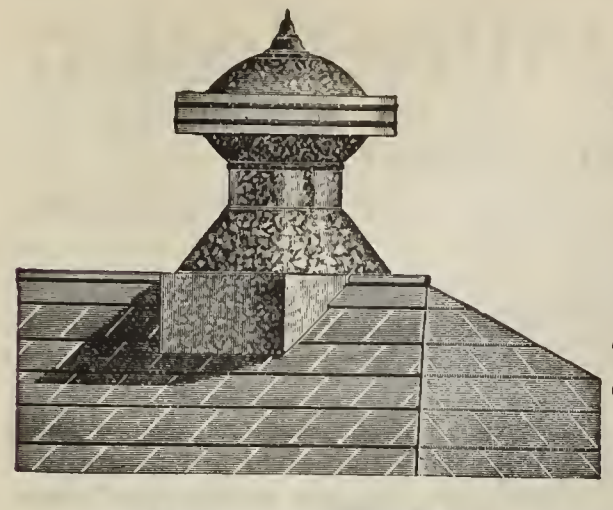
TOOTH AND NAIL BRUSH HOLDER.

(Patented Feb. 6, 1894.)

THIS new and novel article fills a long-felt want for an attractive, durable and useful Tooth and Nail Brush Holder. It will hold any size brush, and, as each opening is numbered, the brushes are kept separate and there is no possibility of getting the wrong one. The ornamentation is lithographed on the surface, and it will not peel or wear off.

For sale by all first-class jobbers in House Furnishing Goods, Hardware, Druggist Sundries and Department Stores. Sample mailed on receipt of 15 cents.

KEEN & HAGERTY, 32 S. Calvert Street, BALTO., MD.



COME OFF THE ROOF

May be a slang expression, but it doesn't apply to

Globe Ventilators.

They "get there" and "stay there"

Through sunshine and through storm, doing the work required of them silently, steadily, satisfactorily.

Send for Special Pamphlet on Ventilation.

——MANUFACTURED BY——

GLOBE VENTILATOR CO.,

TROY, N. Y.

VEDDER PATTERN WORKS,
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TROY, N. Y.

STOVE PATTERNS.

By Day or Contract. Duplicates or Exclusive Designs.
Dressed and Boarded or in the Rough.

Every Description of Stove Patterns made in the very best style. Machine Patterns and Model Making.

THE PENNSYLVANIA
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JOHN K. McLAUGHLIN,
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FIRST-CLASS WORK GUARANTEED.

THE GEORGE W. COPE
Stove Pattern Works.

Original, Artistic and Practical Constructions.
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Detroit, Mich.

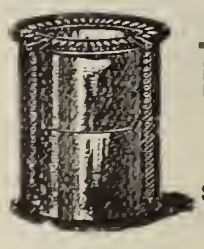
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STOVE PATTERNS
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DIAMOND THIMBLE
IS THE BEST.
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Facings, Supplies, etc., all of the very best at lowest prices. Get copy of the most complete illustrated catalogue ever published, free.

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Our repairs are sure to fit, as they are all made from manufacturers original patterns

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STOVE REPAIRS.

219 Locust St., St. Louis.
A. G. BRAUER.

MUST BE SOME REASON
THERE **RUTLAND LINING** WHY
IS CARRIED BY THE BEST TRADE IN
29 STATES.
IT FITS ANY STOVE AND IS CHEAP.
RUTLAND FIRE CLAY CO., Rutland, Vt.

DON'T FORGET
TARBOX
For your Stoves. All Dealers.

"FIRESTONE."

A new material which makes the strongest, most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

PRESBREY STOVE LINING CO.,
TAUNTON, MASS.



Designers of national reputation. *Superb mechanical facilities.*

THE GOBEILLE PATTERN CO. THE LARGEST PATTERN WORKS IN THE WORLD.

Every workman a brainy specialist.

PATTERNS

Modern and Ornamental Drawings and Patterns for Stoves, Ranges and Furnaces made to order.

Cincinnati Pattern Works,
Front and Lawrence,
Cincinnati, O.

NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.,** Factories, { Cincinnati, O. Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 in.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

Stove Plate Facings.

The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
FIRE-PROOF FACINGS.
RADIATOR FACINGS.
CHARCOAL FACINGS.
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PLUMBAGO FACINGS, &c.

PHILADELPHIA, PA. - J. W. PAXSON & CO.

MARCY STOVE REPAIR CO.

MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of THE GLOBE VENTILATOR CO.,

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Foundry, 157 to 167 Imlay St., Brooklyn.

N. Y. NICKEL PLATING & MFG. CO.

227 & 229 WEST 29th ST., NEW YORK.

Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

MANUFACTURERS OF SUPPLY PIPE FOR GAS STOVES.

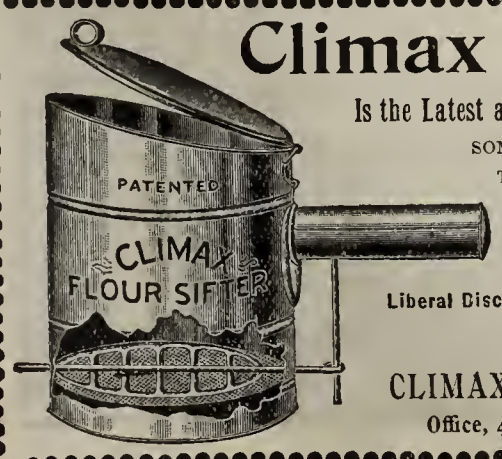
Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

The sample tells the story!

A sample of Dixon's Pure Flake Lubricating Graphite is sent free of charge with an interesting and instructive pamphlet. Every wide-awake engineer and mechanic should send for them.

JOS. DIXON CRUCIBLE CO., Jersey City, N. J.

Climax Flour Sifter



Is the Latest and Best Flour Sifter on the Market.

SOME OF ITS ADVANTAGES ARE:

That it is operated with one hand instead of two.
It is done with a natural motion of the hand.
It has a cover and does not scatter the flour.
It has an agitator that will not grind foreign substances through the wire netting.

Liberal Discounts to Wholesale Trade. Write for Prices.

Manufactured by the

CLIMAX MANUFACTURING COMPANY,

Office, 415 Cuyahoga Building, Cleveland, Ohio.

CLAD'S

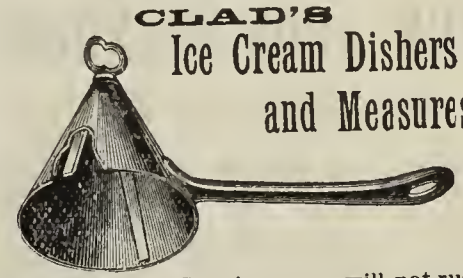
Iron Enameled Ice Cream Cans.



Do not buy Cans until you get our prices. We are Headquarters.

CLAD'S

Ice Cream Dishers and Measures.



Millions in use. Seamless cups, will not rust. German Silver knives; and not tin knives. Cream will not stick to sides. Sizes standard.



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V. CLAD & SONS,

MANUFACTURERS,

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— "Aw—have you such a thing as—as a fulldwess cigah?" inquired Fweddy, who was on his way home from a reception.

"I think not, sir," said the tobacconist reflectively, "but we have some in very elegant wrappers."—*Chicago Tribune.*

— MAKING SURE OF IT.—Host: "I hate to send you out in such a blustering night as this, old fellow."

Guest: "It is raining pretty hard. I say, couldn't you loan me your umbrella?"

Host: "Certainly; and—er—I guess I'll walk home with you myself. I really need the exercise."—*Judge.*

USE VANDERMAN'S SPECIAL TOOLS.

No Plumber or Steam-Fitter can Afford to be Without Them.

THE VANDERMAN PIPE VISES CANNOT BE EQUALED.

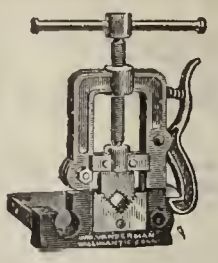


Lead Pipe Cutter.

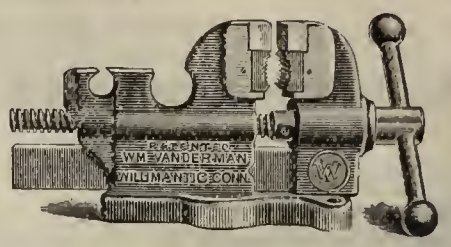


Joint Runner (applied).

Lead Pipe Bender.



Hinged Pipe Vise.



Comb. Bench Vise with Bending Forms.

USE VANDERMAN'S ESTIMATE AND LIST-BOOK. It prevents mistakes in making estimates.

OFFICE ESTIMATE BOOK, $1.50 each. POCKET ESTIMATE BOOK $0.40 each. Sent by Mail prepaid if cash is sent with order.

The Vanderman Plumbing & Heating Co., Willimantic, Conn.



Buy Iwan's Volcano Revolving & Ventilating Chimney Top

The best in the World

For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.

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Cincinnati Stamping Co., Cincinnati, O.
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IWAN BROS.
Sole Mfrs., Streator, Ills.

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A COMPREHENSIVE TREATISE ON

THE ART OF MOLDING,

INCLUDING CHAPTERS ON

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Practical Molder and Manager of Foundries.

Illustrated with over Three Hundred Engravings.

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Will be sent free on receipt of the price.

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Publisher and Bookseller,

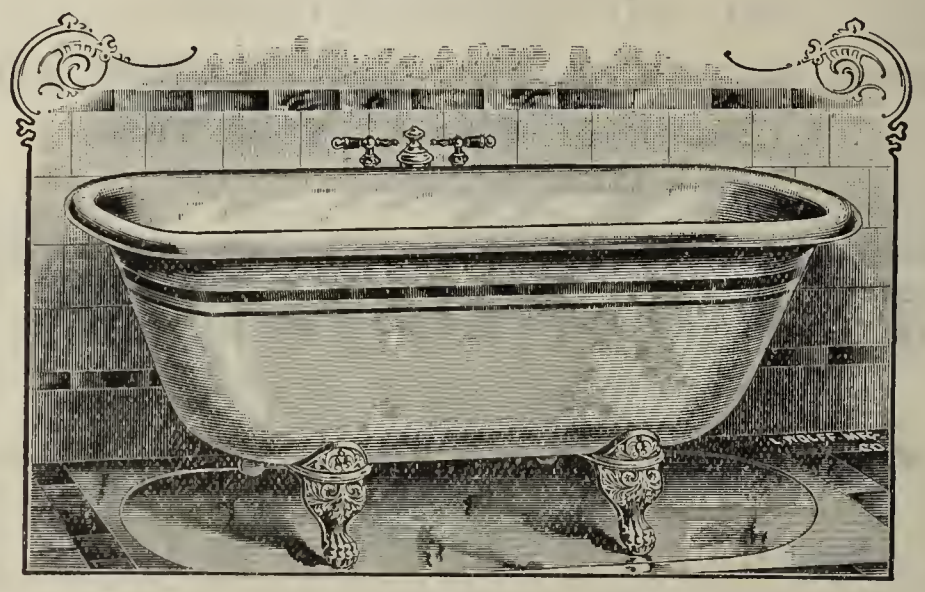
96-102 Reade St., New York.

L. WOLFF MFG. CO.,

PLUMBING GOODS.

GENERAL OFFICES, 93 West Lake Street, Chicago.

WOLFF'S ENAMELED IRON BATHS.



B-63.

Samples of our make Enameled Goods may be seen at our

SHOW ROOMS: 91 Dearborn St., CHICAGO; 1533 Blake St., DENVER, COLO.; 11 N. Washington Ave, MINNEAPOLIS, MINN.

WRITE FOR SUPPLEMENT NO. 1 (WOLFF'S ENAMELED BATHS)

DO YOU WANT TO TAKE A QUICK BATH?

BUY ONE OF THE

ECONOMY PORTABLE BATH TUBS

ON CASTERS
WELL PAINTED
WEIGHT, 24 Lbs.
WITH
PLUG & LEG
ATTACHMENT
FOR
EMPTYING



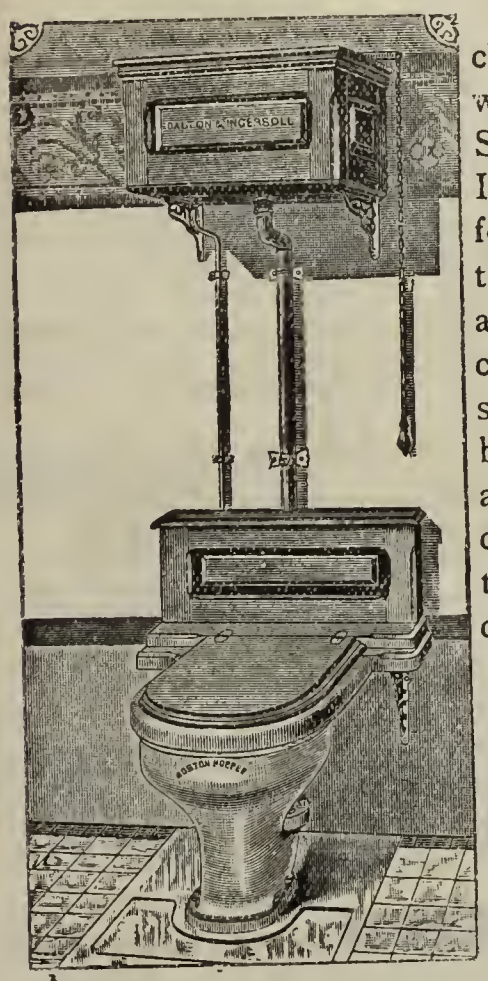
5 FT. 5" LONG
2 FT. WIDE
ROUND BOTTOM
IT IS MADE OF
THE BEST ZINC
WITH RIM OF
WELL SEASONED
BENT HARD WOOD
ENAMELED IN SIDE

IT SURPASSES ALL OTHERS IN
SMALL AMOUNT OF WATER REQUIRED,
NEATNESS OF DESIGN, SPACE OCCUPIED.

PATENTED AND MANUFACTURED ONLY BY:
FOREST DRUKENBROD NEW BERLIN, OHIO.

BOSTON HOPPER WATER CLOSET.

(TRADE-MARK.)



Considered the perfection of closets. It is a modification of what is known to the trade as a Short Hopper and Trap combined. Its exterior outline is in pedestal form, which gives perfect support to the bowl. This construction will allow the seat to rest directly on the closet, dispensing with the use of seat legs, if so desired, allowing a better opportunity for cleaning around the closet. This feature of construction will recommend itself to those looking for simplicity and cleanliness.

[See our advertisement next week for sectional view.]

—MANUFACTURED BY—

Dalton-Ingersoll Co.,

Wholesale Dealers in Plumbers' Supplies,

171, 173 & 175 High St. (Fort Hill Square).
55, 57 & 59 Purchase St., Boston, Mass.

THE STEEL CLAD BATH

is an indestructible, graceful steel shell lined with heavy tinned and planished copper. It cannot warp, rust, or collect dirt, and is an open sanitary fixture at a moderate cost. Enameling and decorations to match the bathroom.

FOR SALE BY ALL JOBBERS.

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Steel Clad Bath Co. of New York,

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Detroit, Mich.,

GEORGE BOOTH, President.

THE HOWELL PATENT



SHOWING SAFETY SPRING.

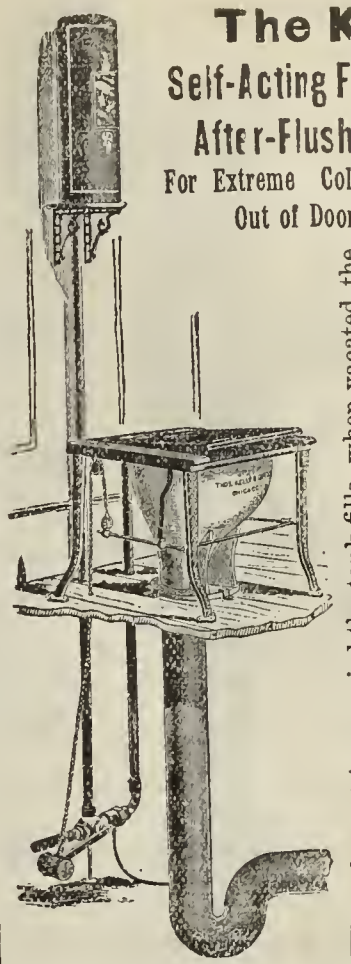
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For Extreme Cold Places and Out of Door Work.

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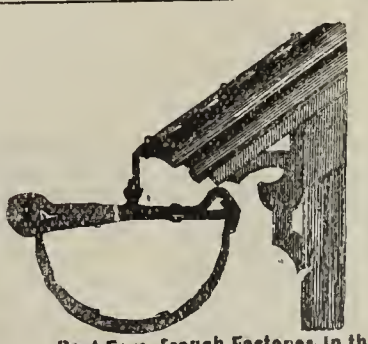
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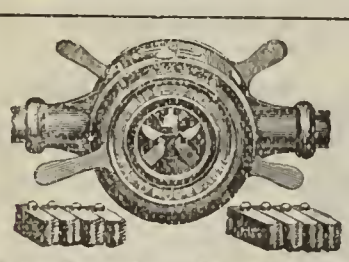
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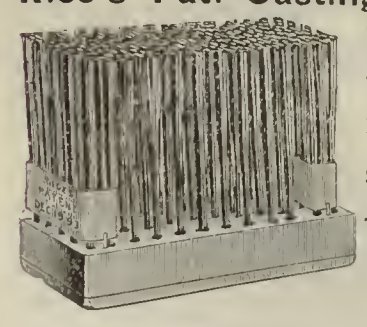
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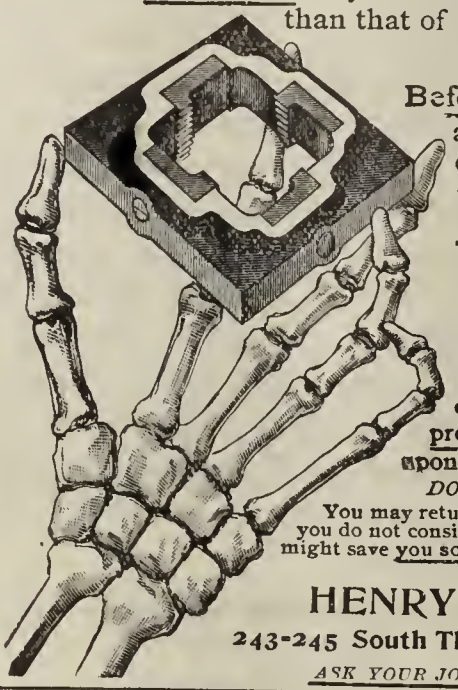
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Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

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The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



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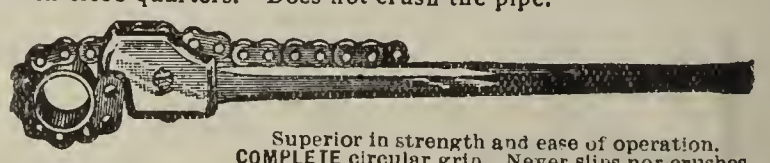
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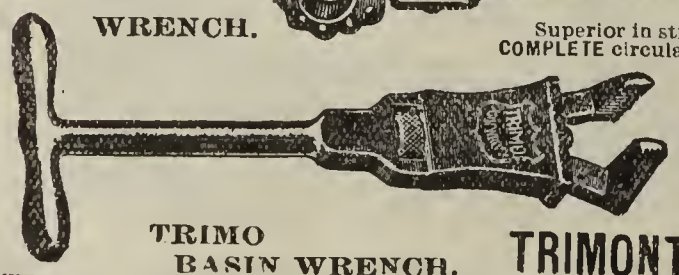
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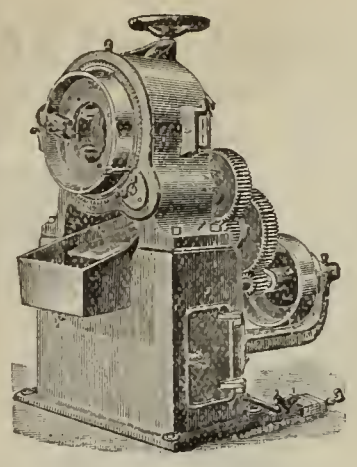
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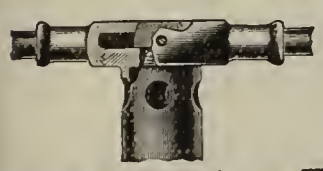
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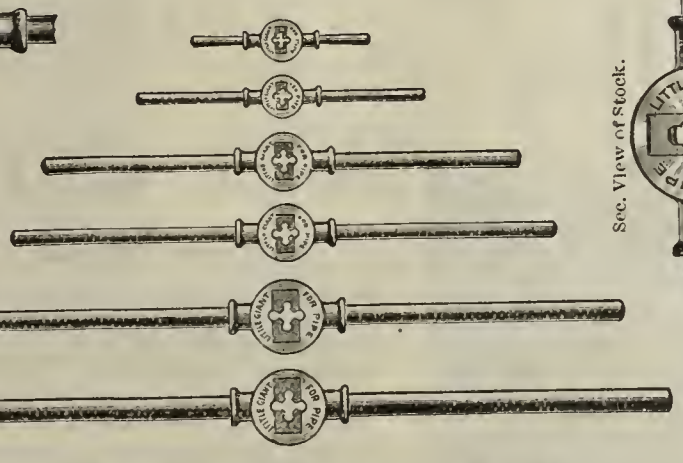
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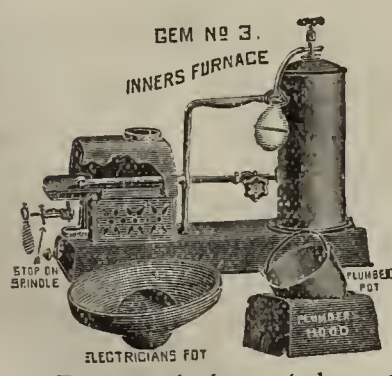
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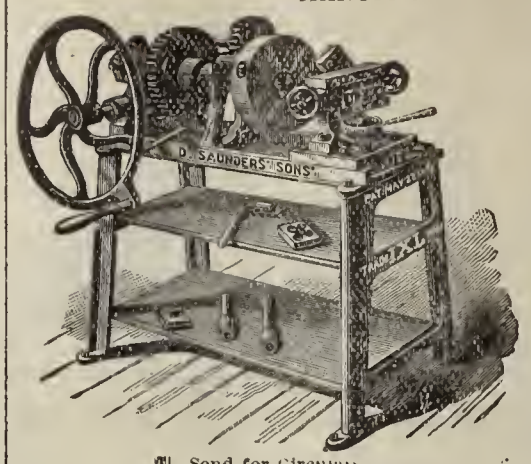
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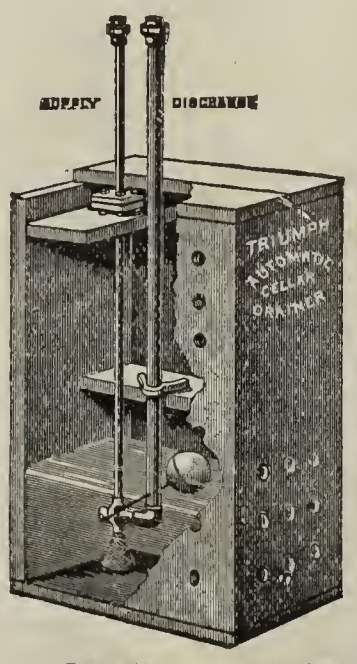
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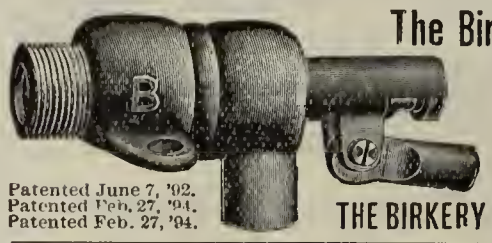
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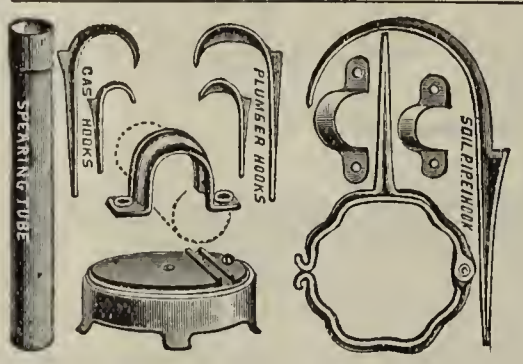
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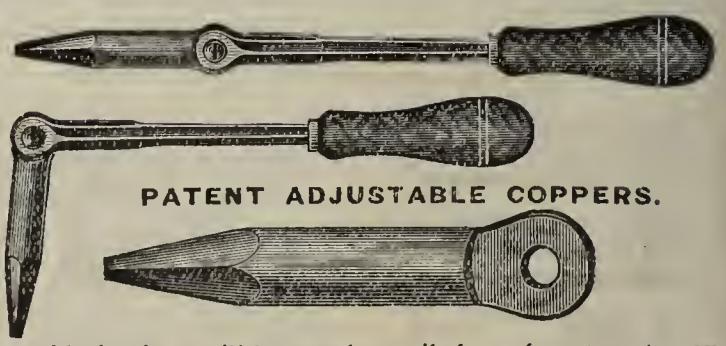
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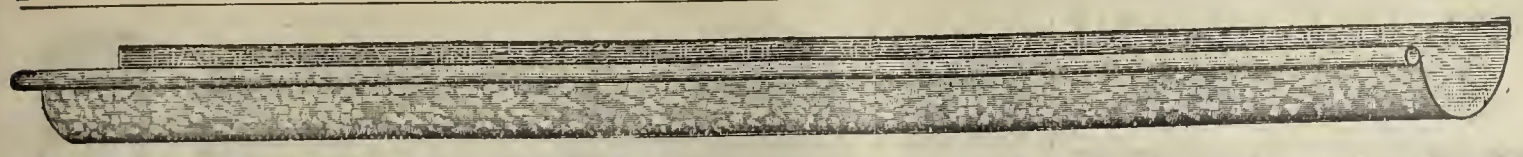


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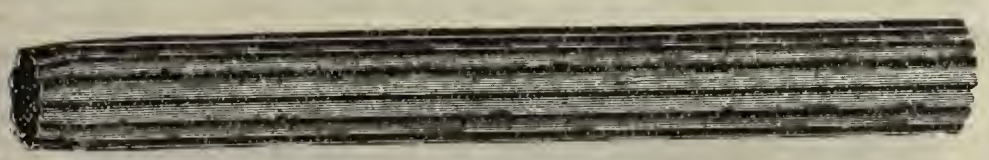
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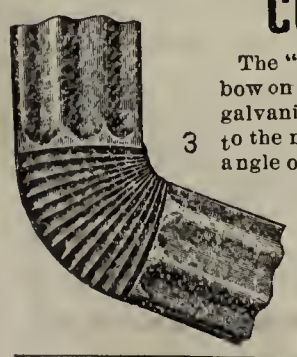
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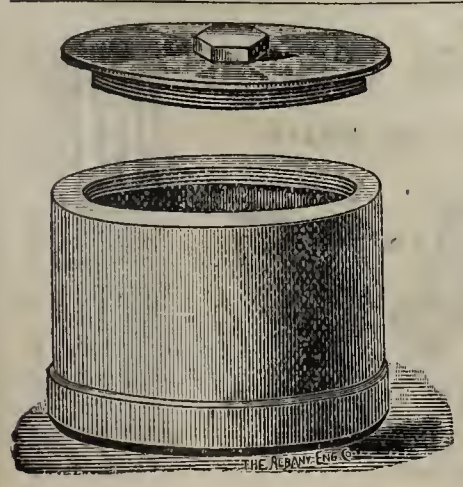
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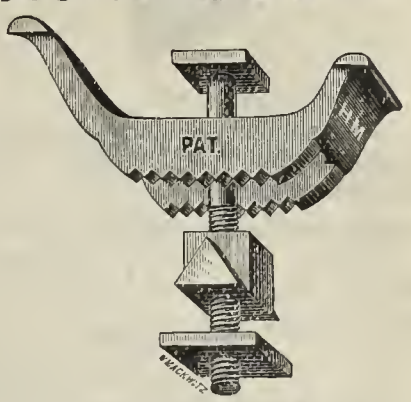
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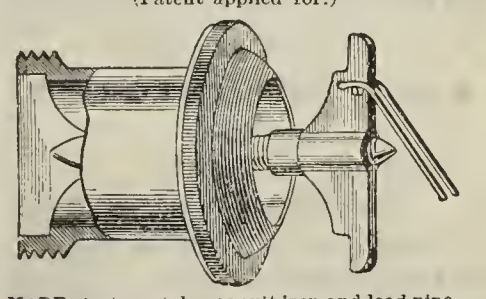
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(Patent applied for.)



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PATENT

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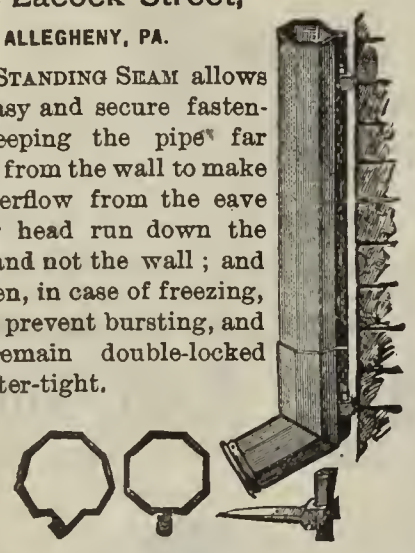
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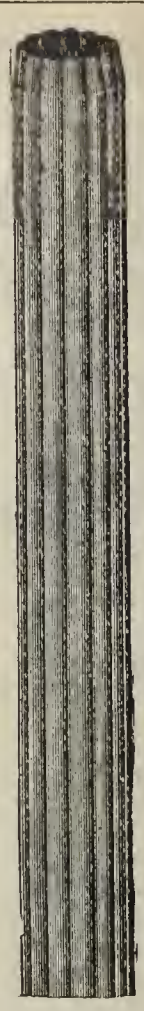
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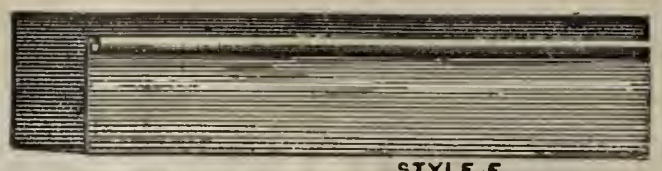
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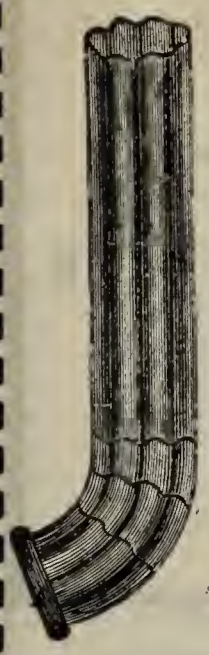


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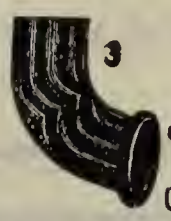
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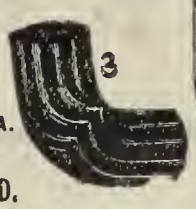
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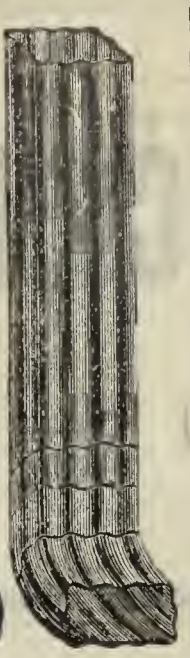
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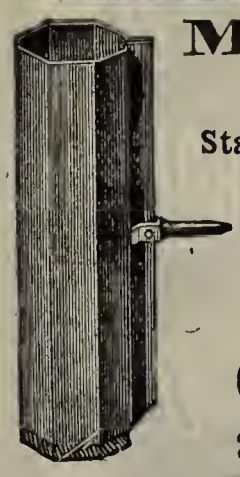
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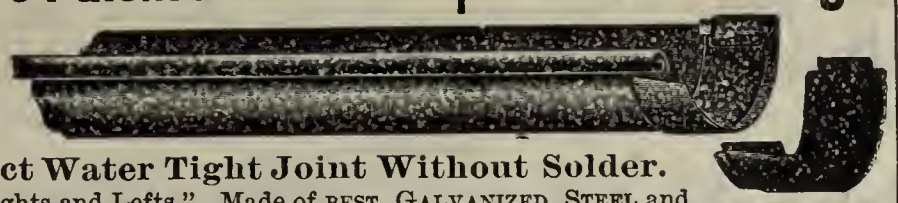
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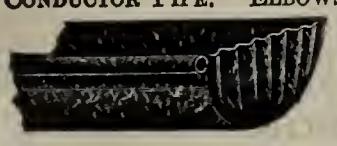
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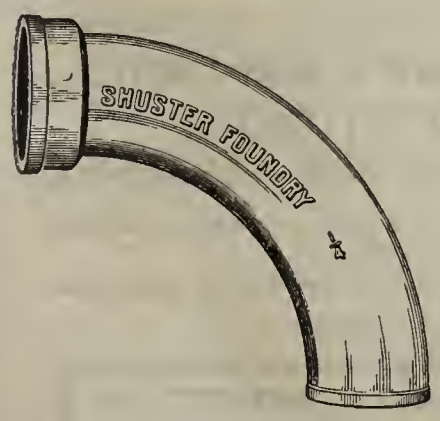
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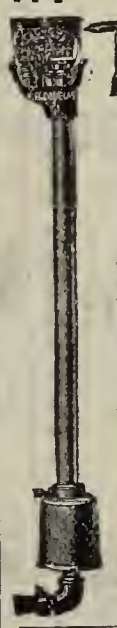
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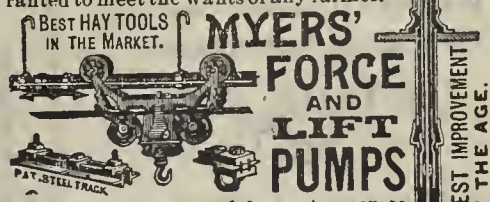
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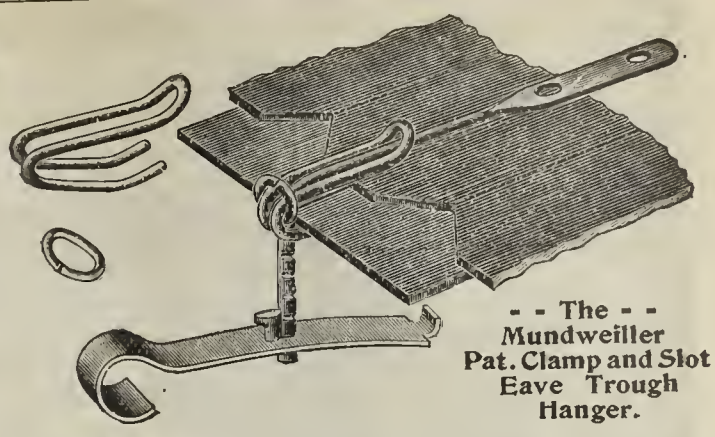
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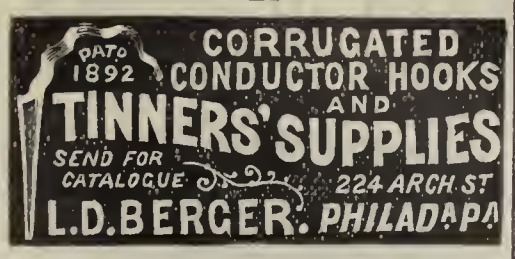
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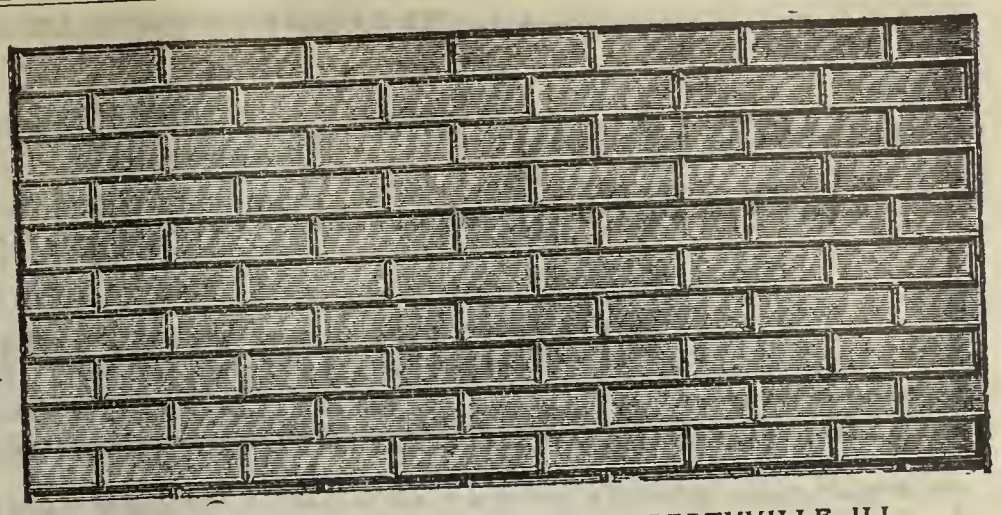
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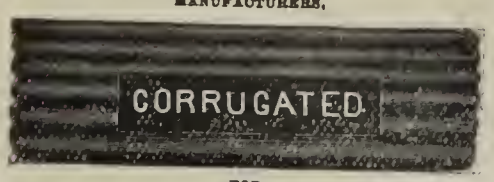
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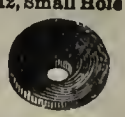


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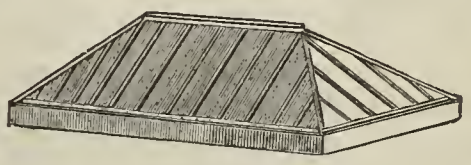
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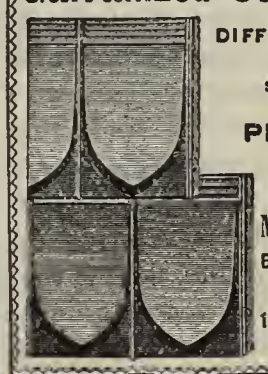
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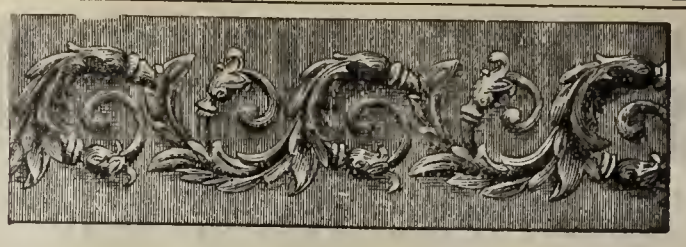
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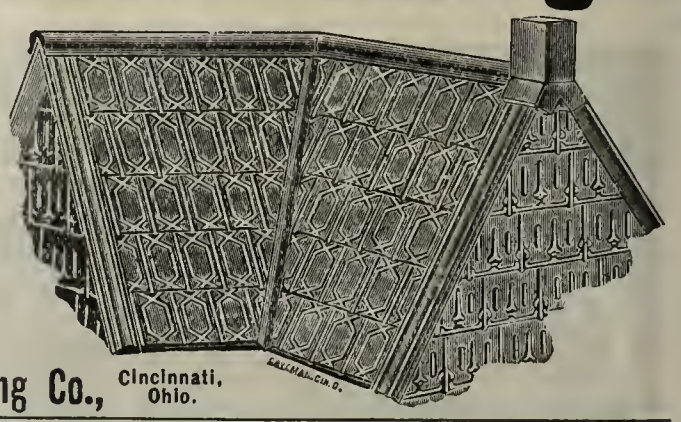
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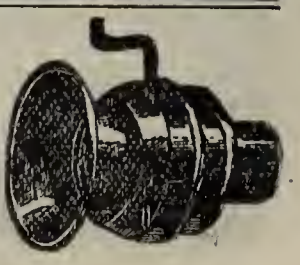


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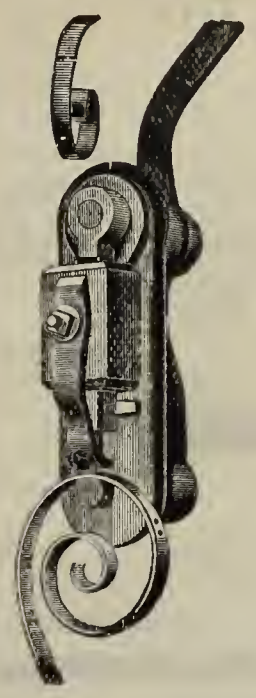


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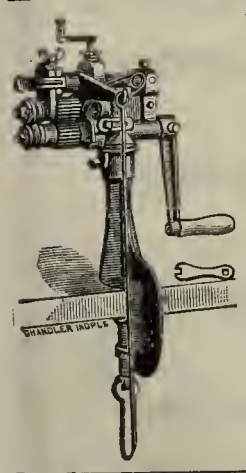
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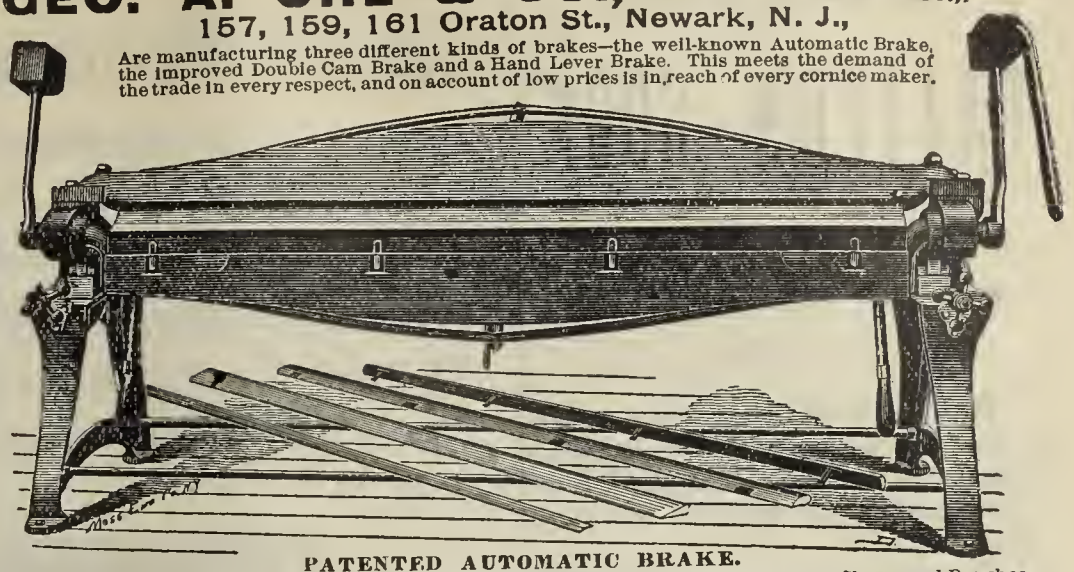
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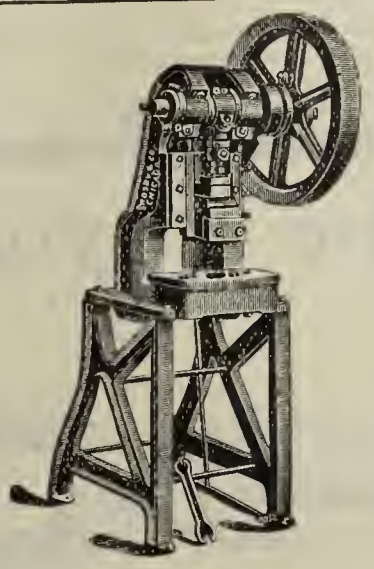
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FIG. 1

FIG. 2.



FIG. 3.



FIG. 4.

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Fig. 2. Represents an end view of pipe and shows construction of seam.
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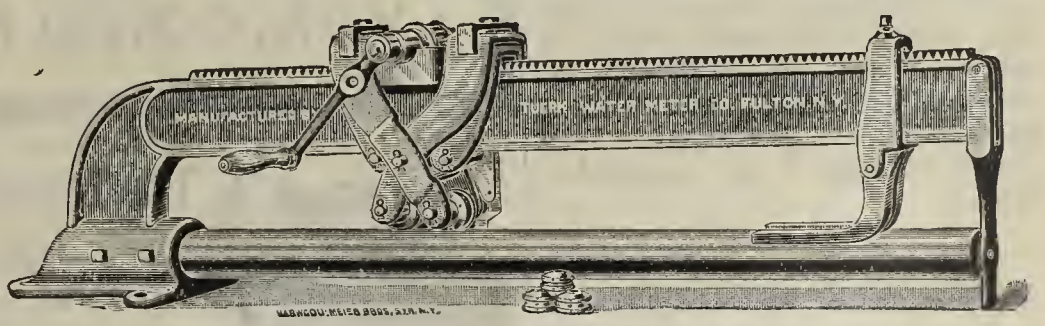
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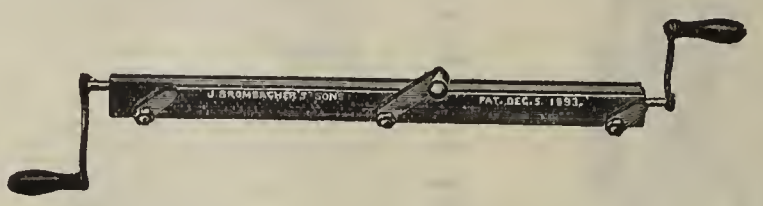
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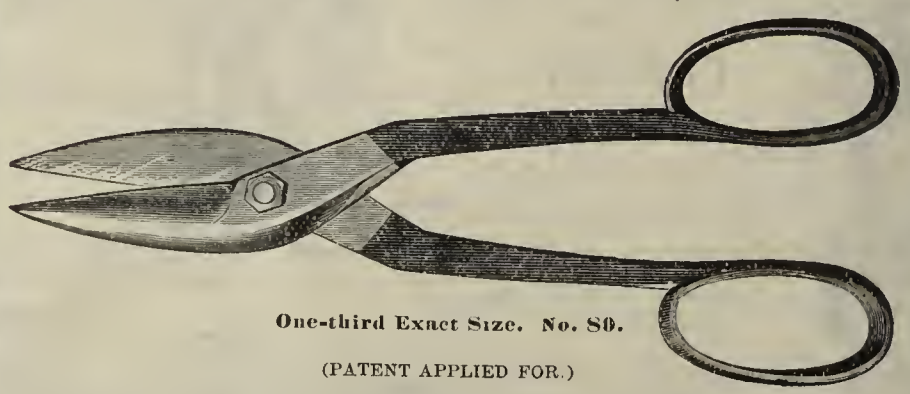
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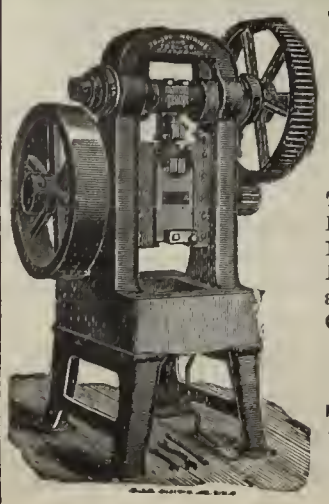
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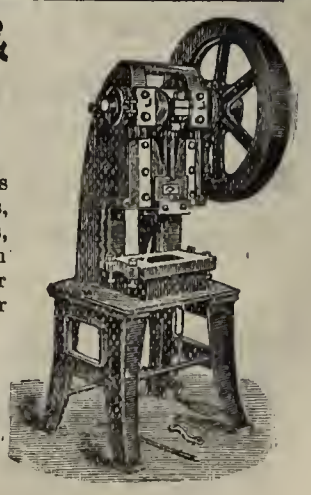
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Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
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Kansas City Metal Roofing and Corrugating Co., Kansas City, Mo.
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N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugating Co., St. Louis Mo.
Souther, E. E. Iron Co., St. Louis, Mo.
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Lyon, Conklin & Co., Baltimore, Md.

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Bangor Excelsior Slate Co., Bangor, Pa.
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Brombacher's Sons, Jacob, 30 Cliff N. Y.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover, Del.

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Keene, Geo. C. & Co., Cincinnati, O.
Michigan Stove Co., Chicago, Ill.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
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Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co. Toledo, O.
Tuerk Water Meter Co., Fulton, N. Y.

Shingles and Tiles, Metallic.

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Burton, W. J. & Co., Detroit, Mich.
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Cortright Metal Roofing Co., Philadelphia, Pa.
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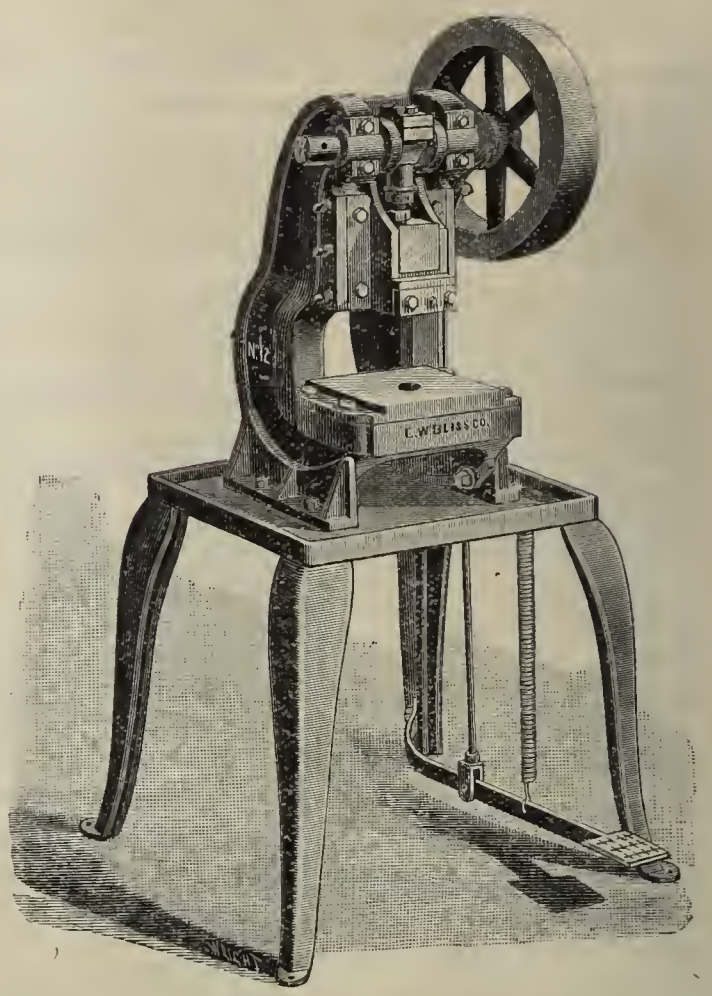
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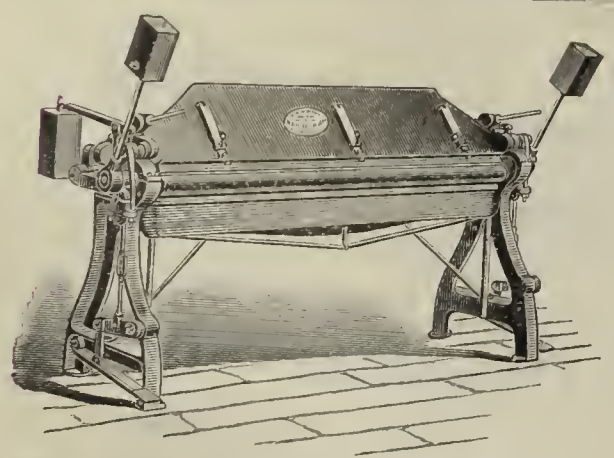
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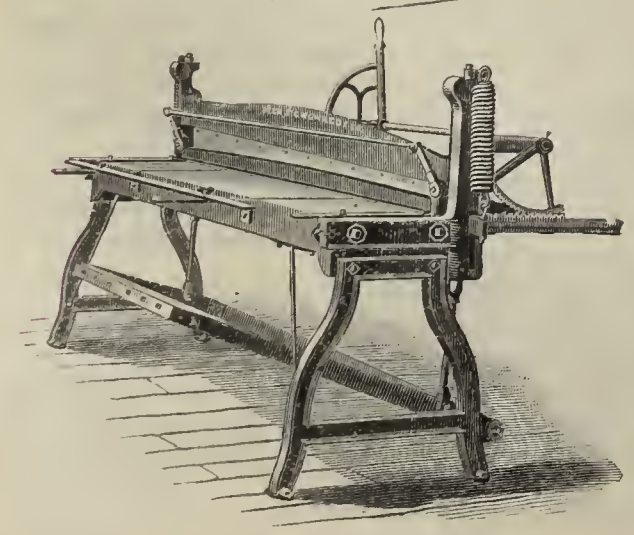
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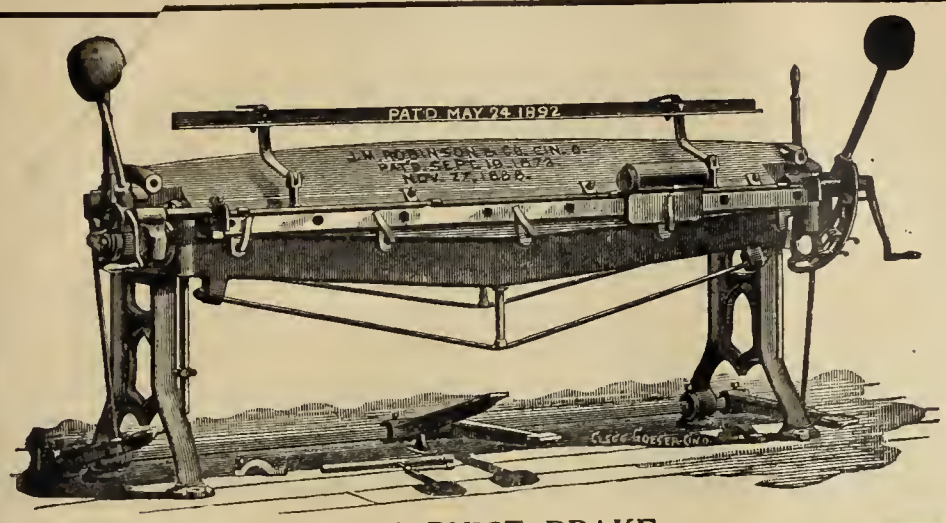
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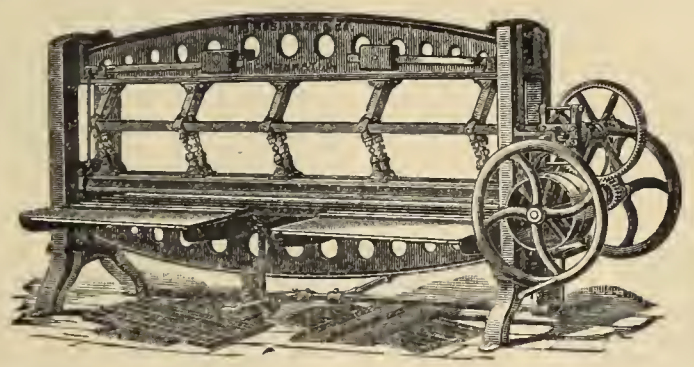


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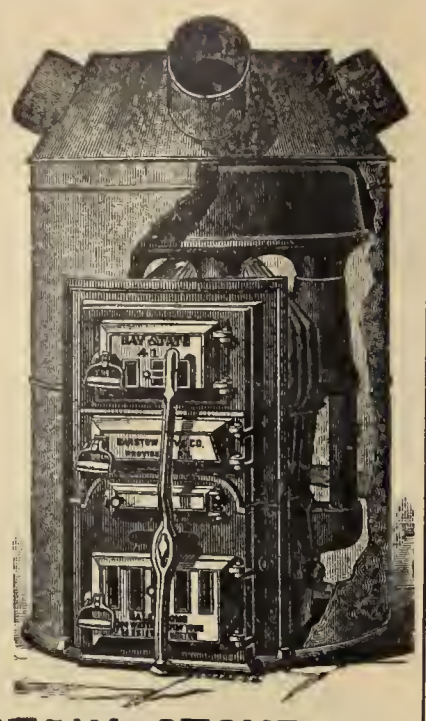
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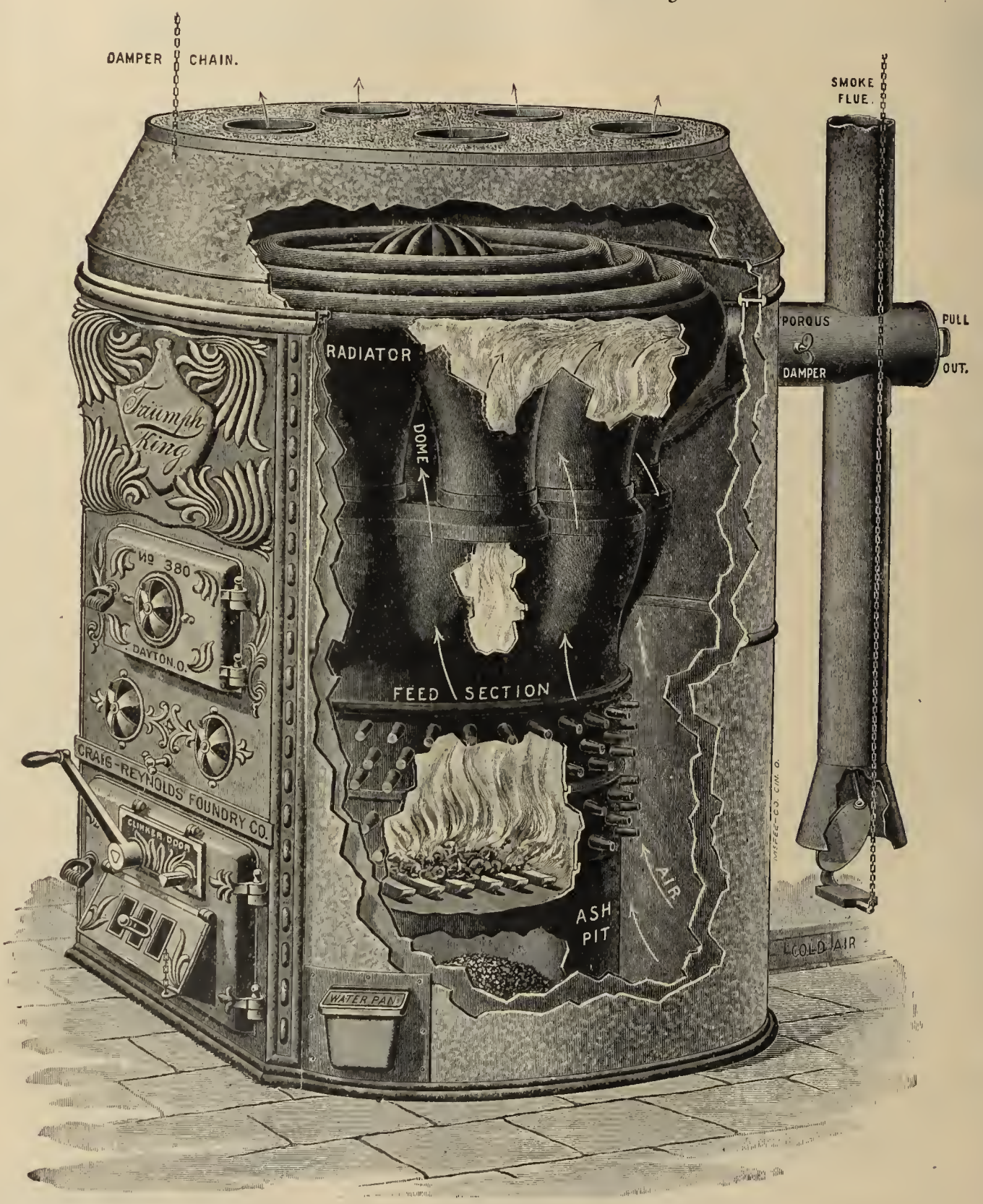
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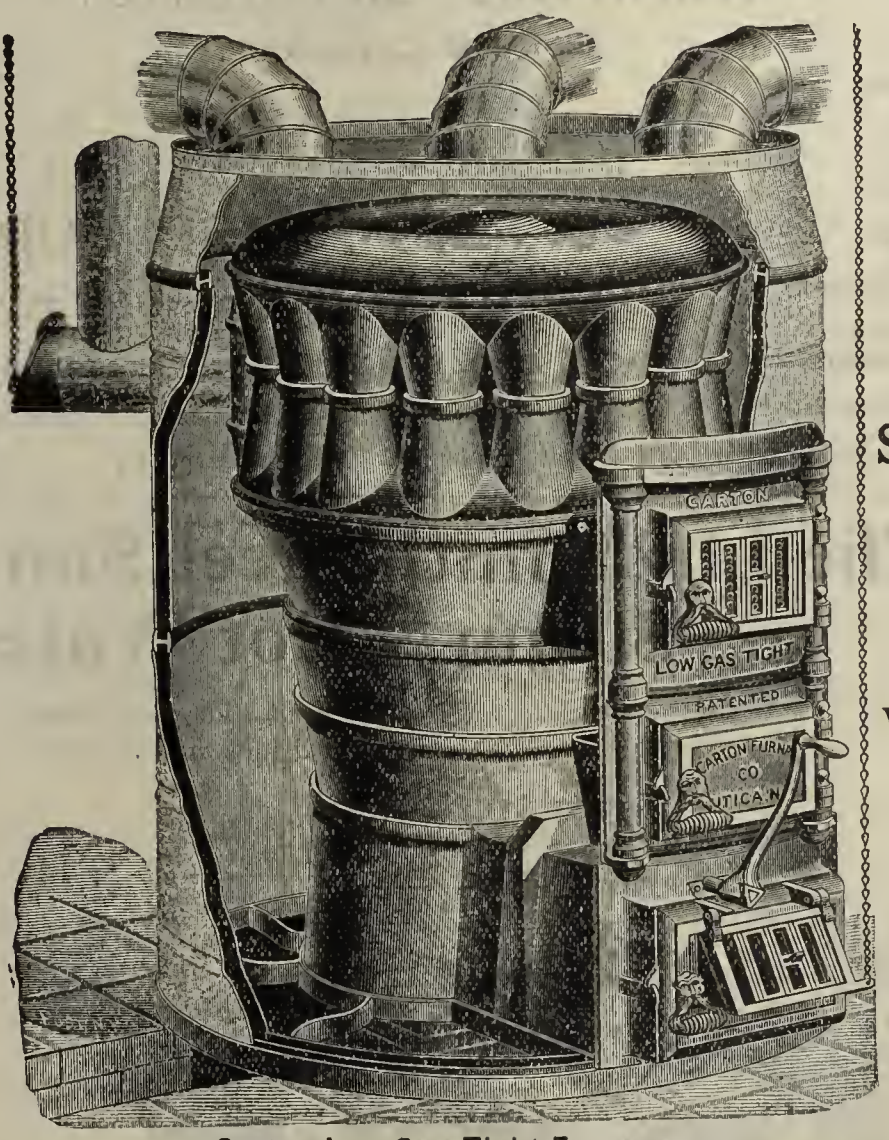
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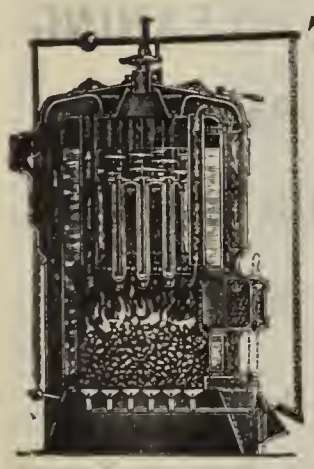
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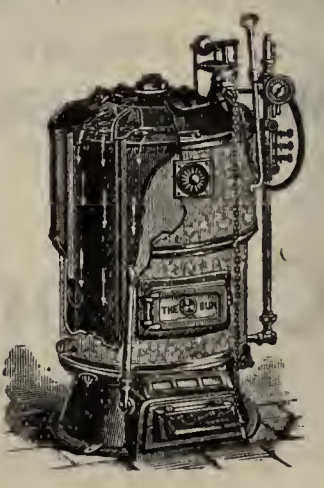
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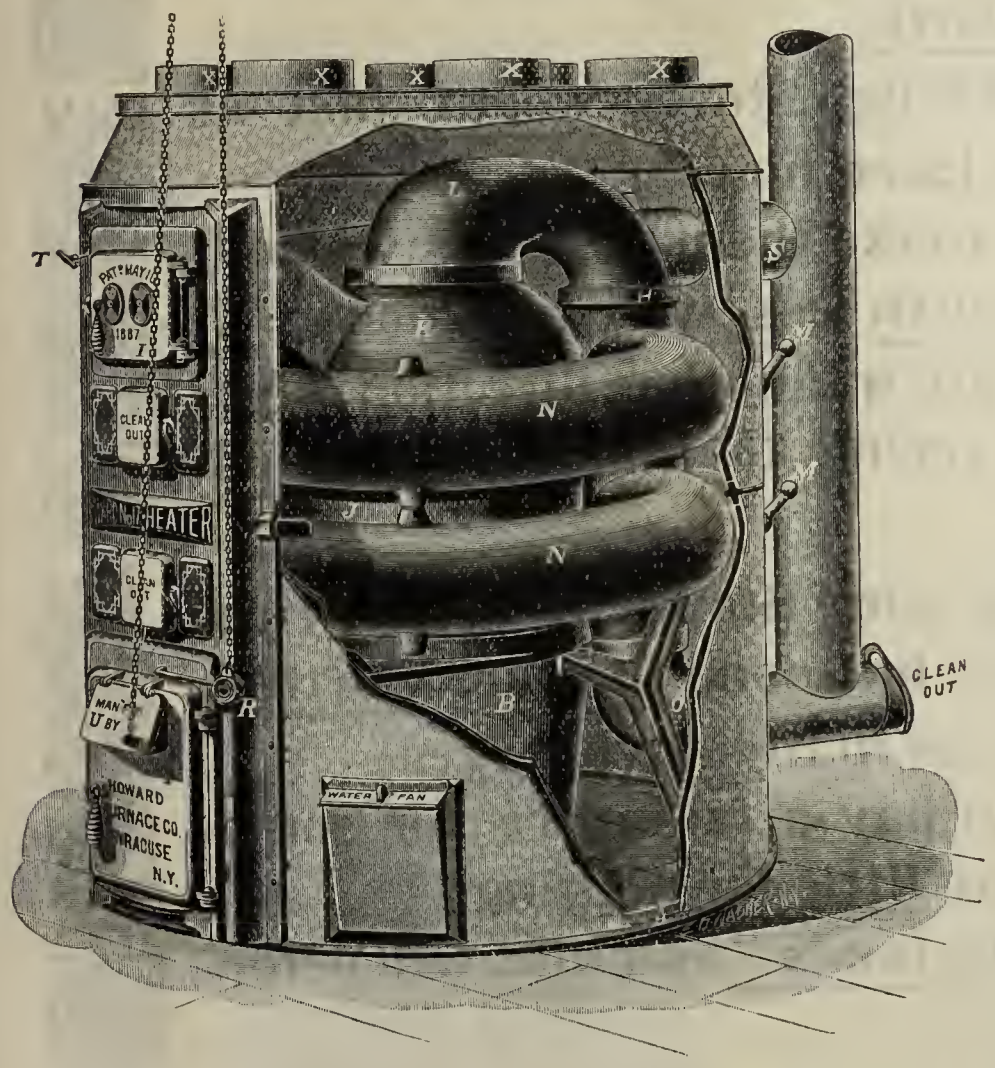


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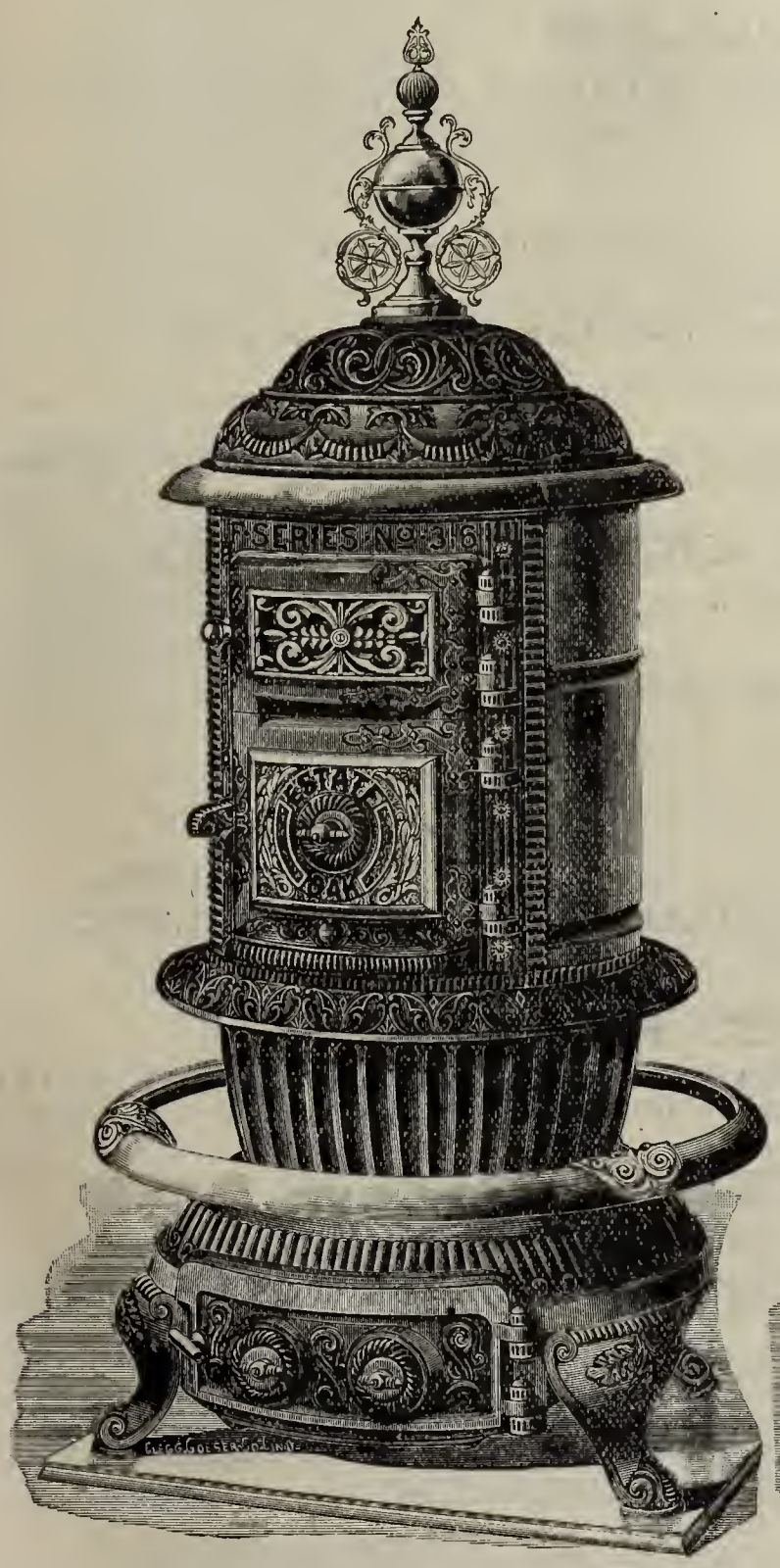
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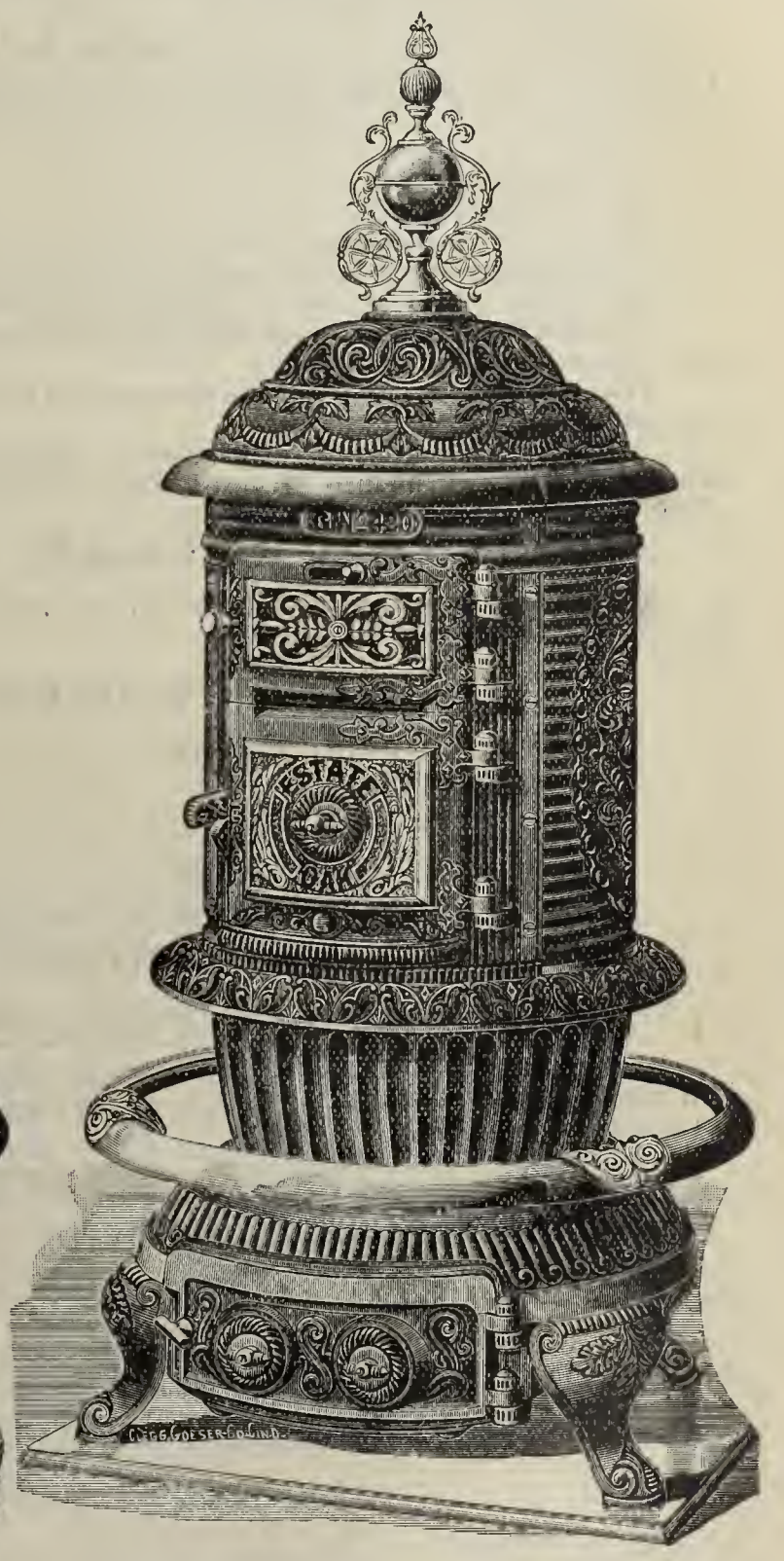
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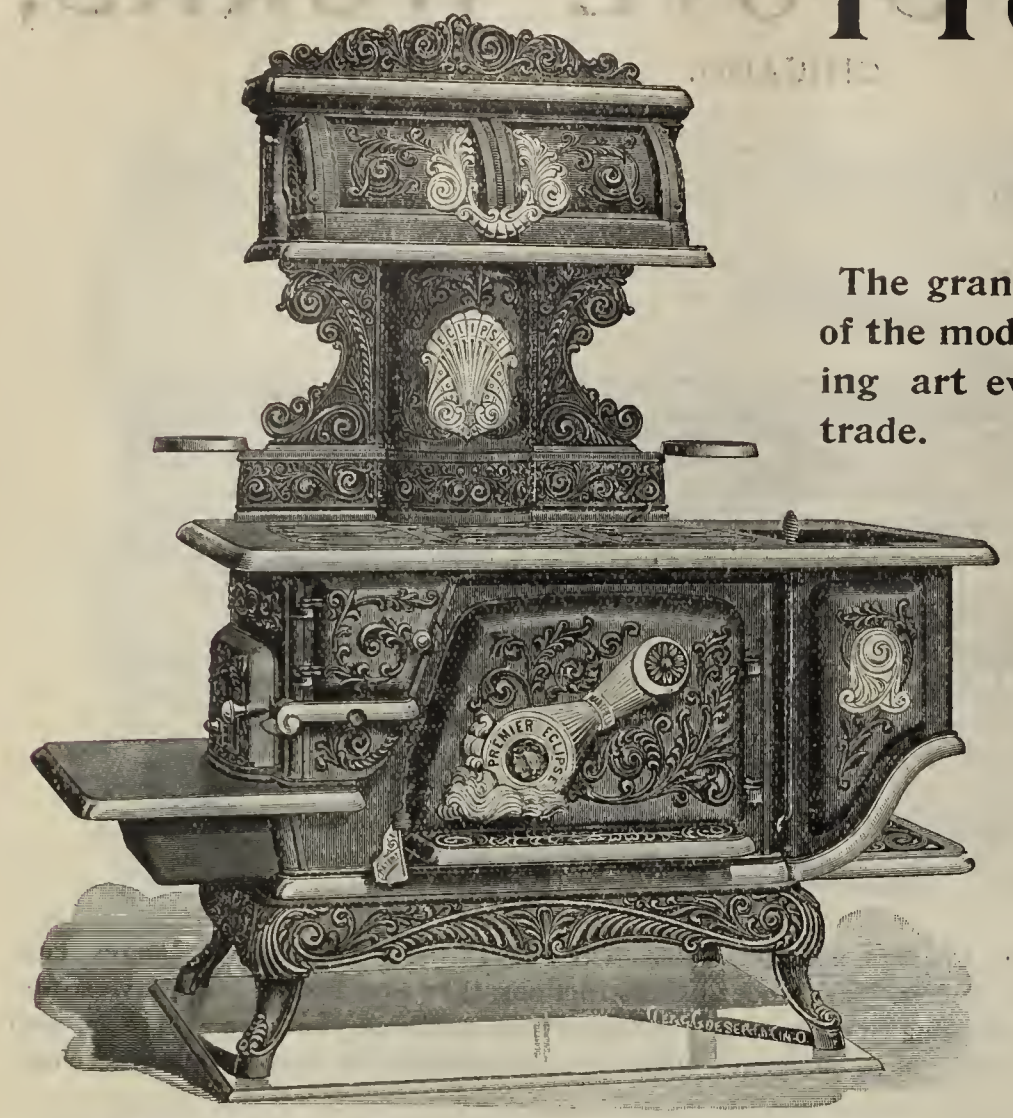


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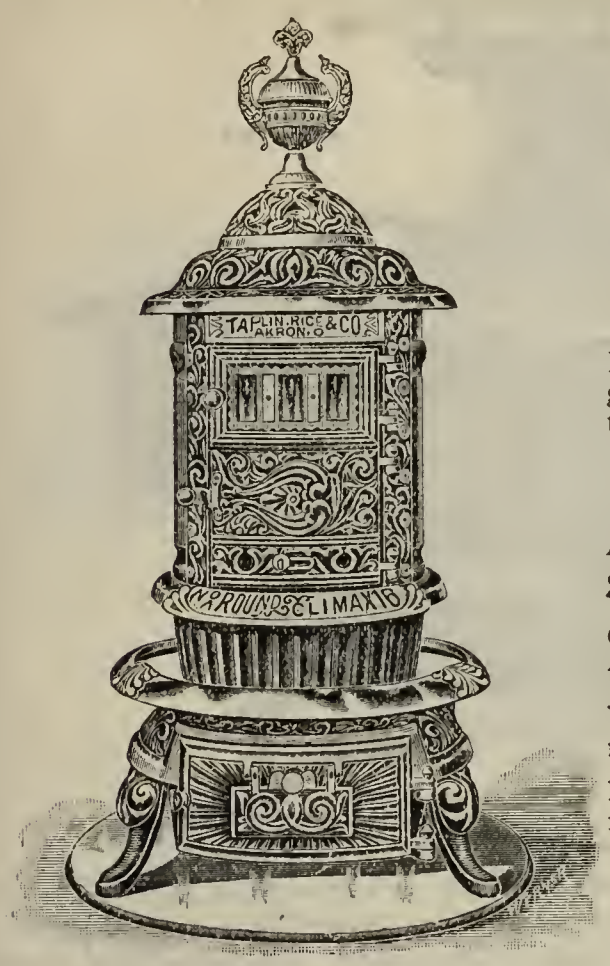
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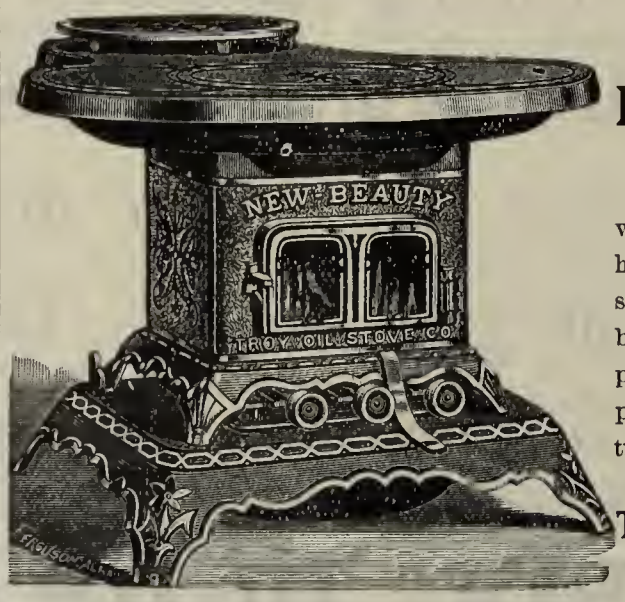
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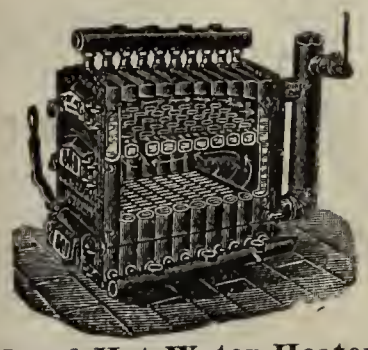
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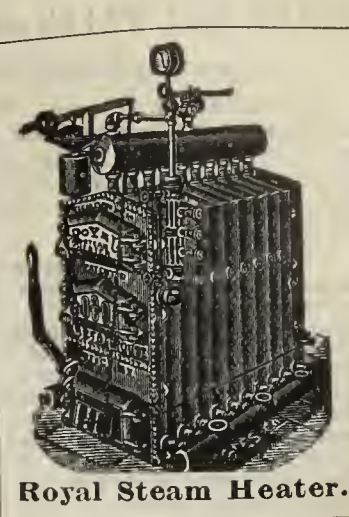
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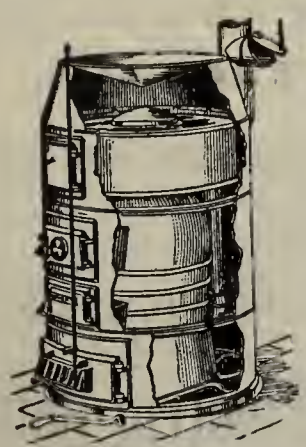
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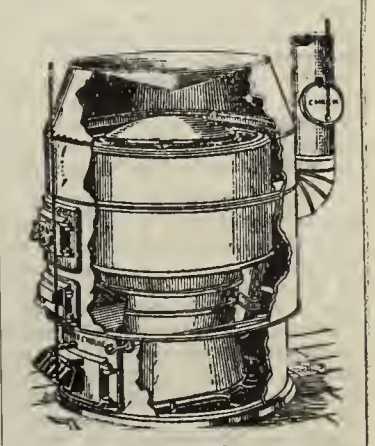
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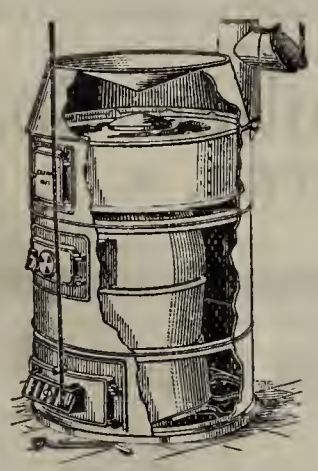


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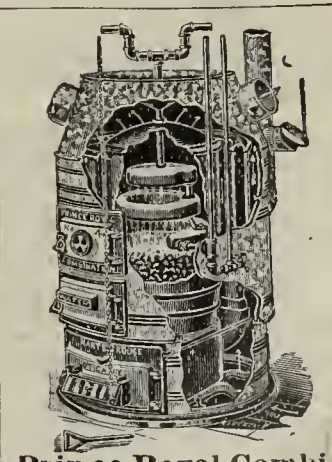


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—BY—

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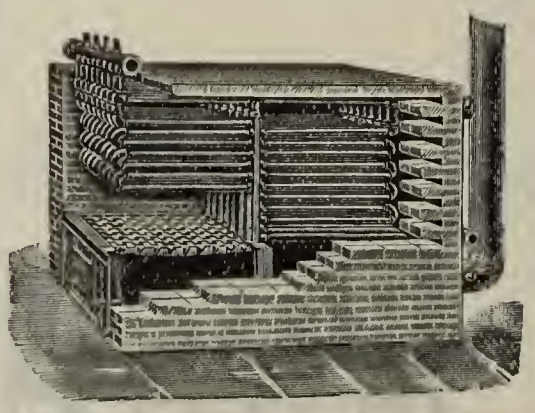
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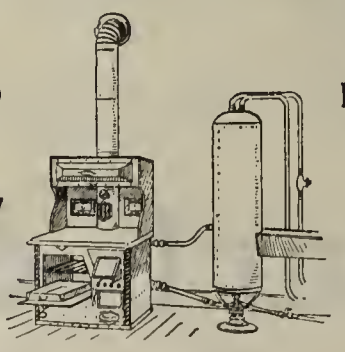
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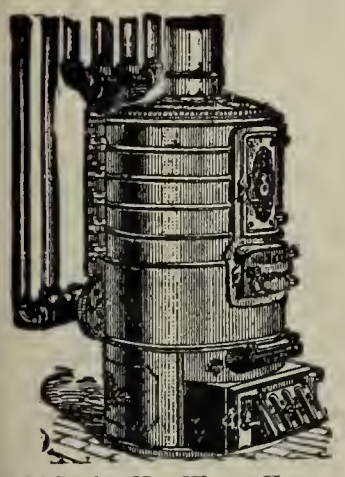
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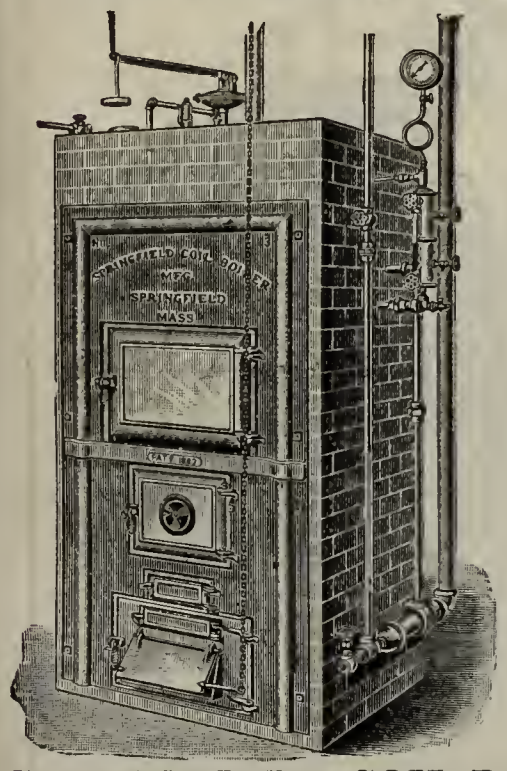
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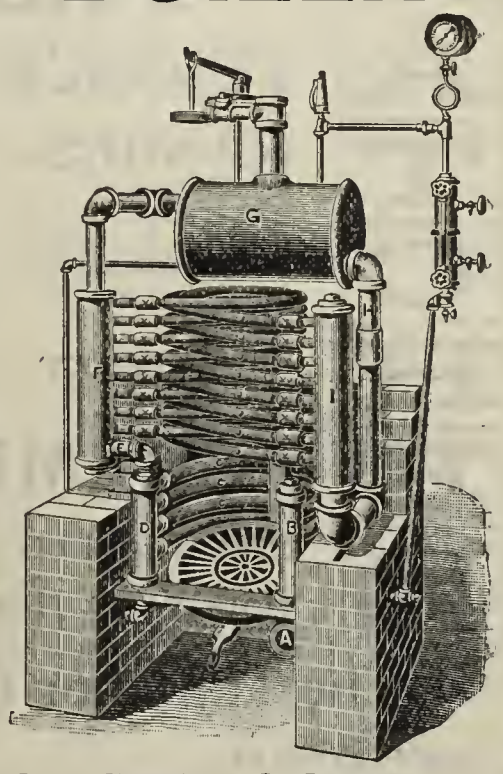


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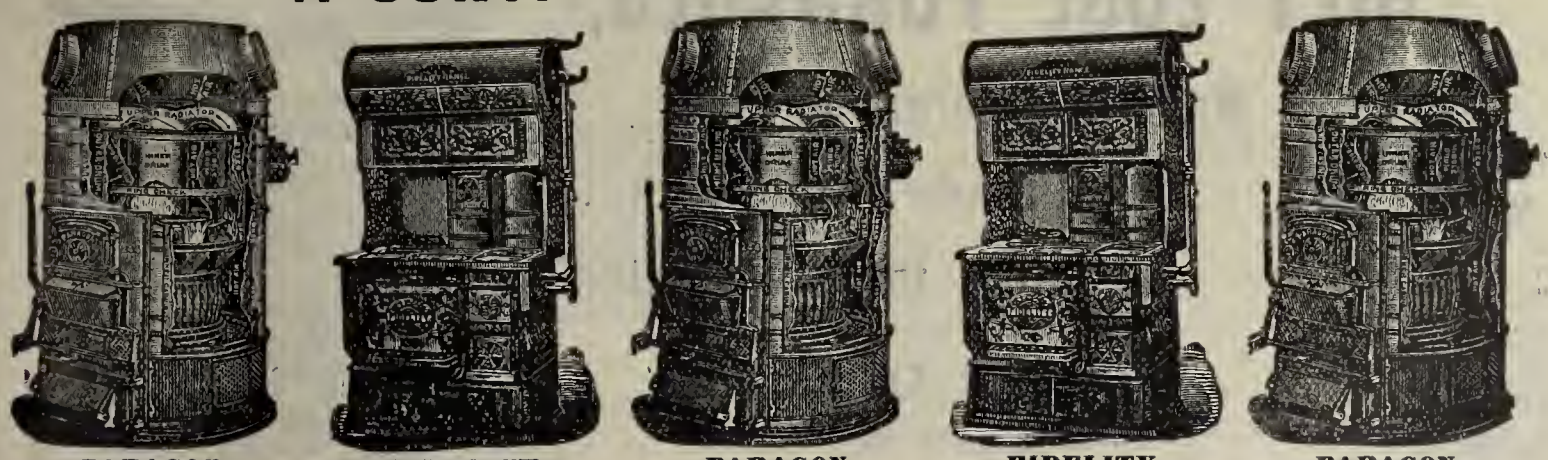
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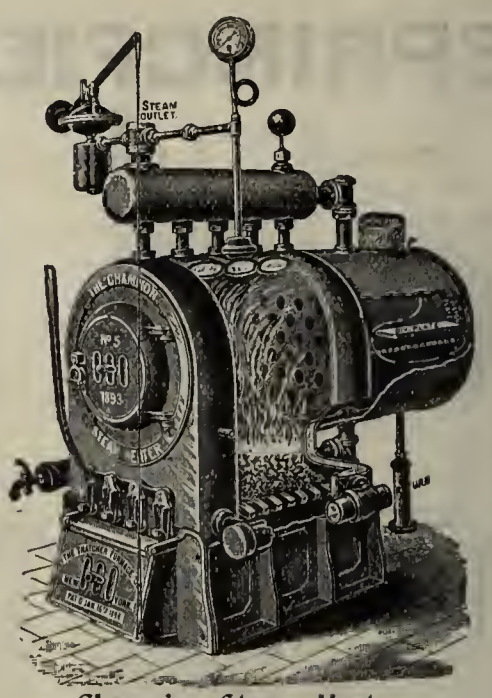
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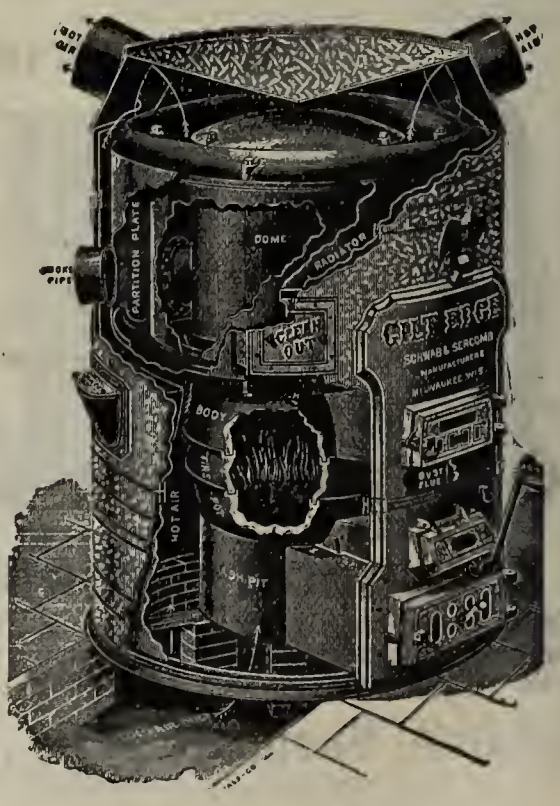
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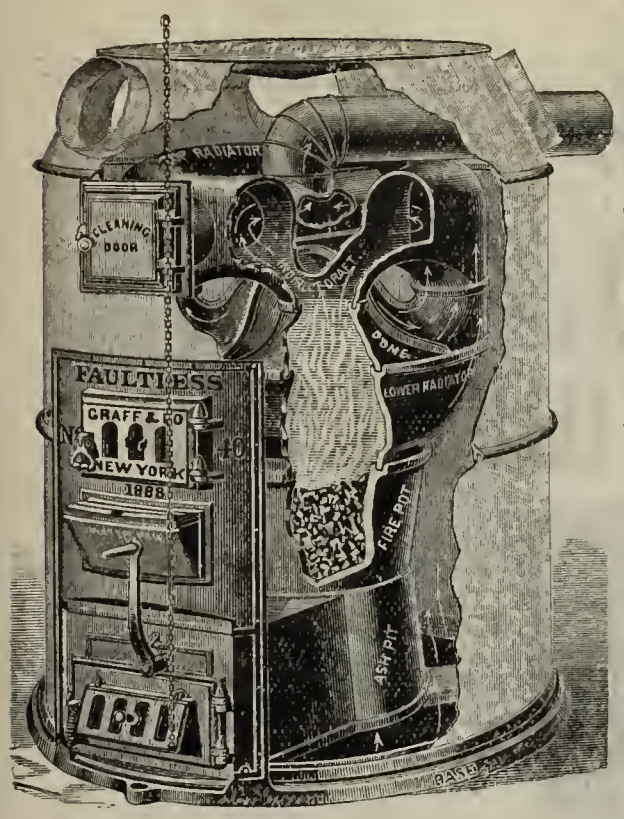
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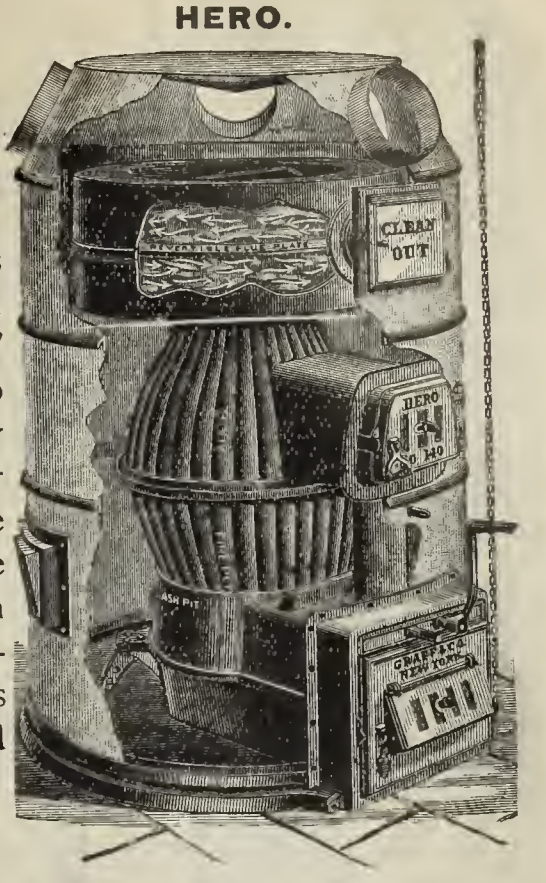


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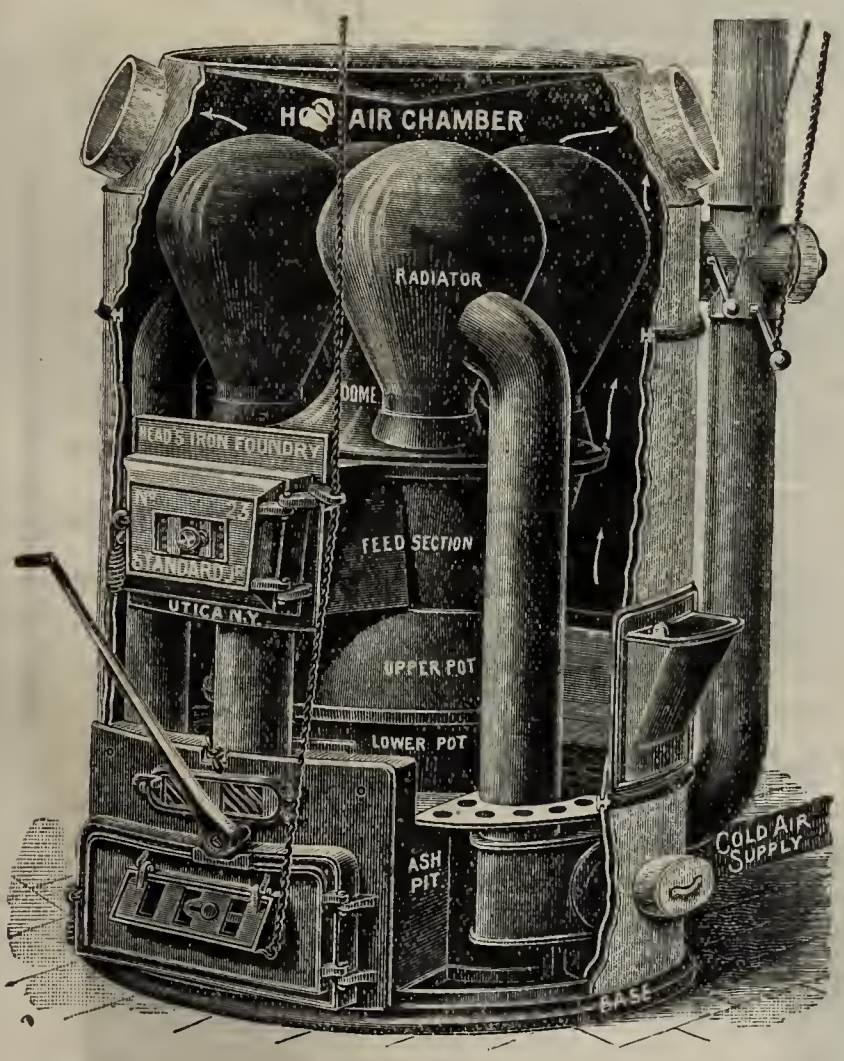
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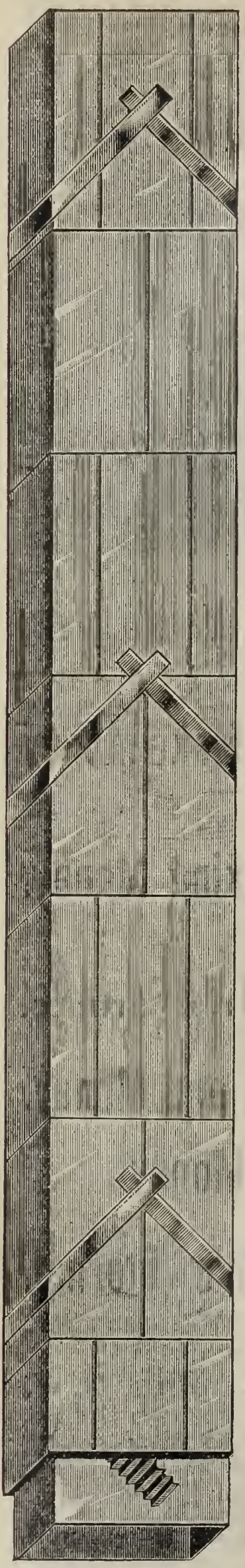
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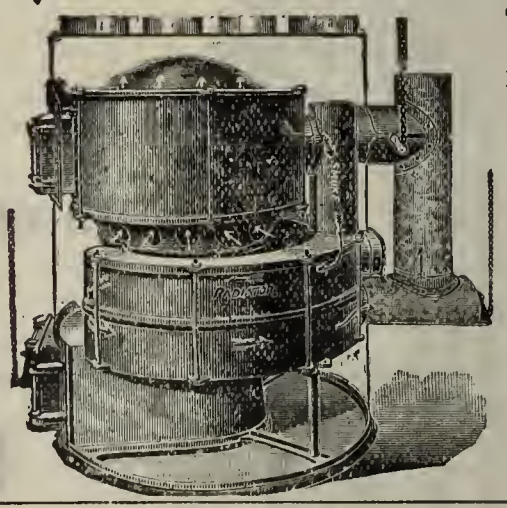
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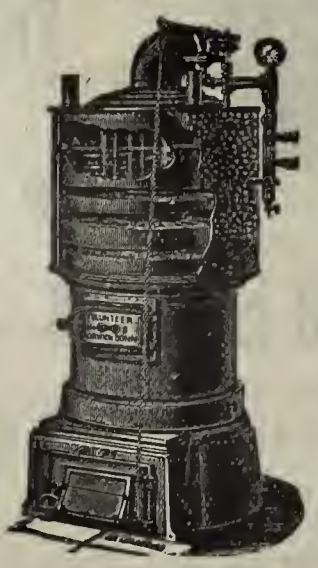
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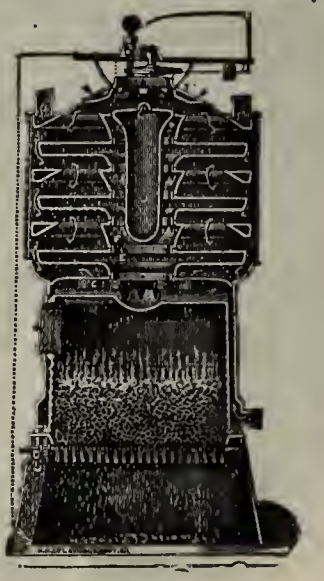
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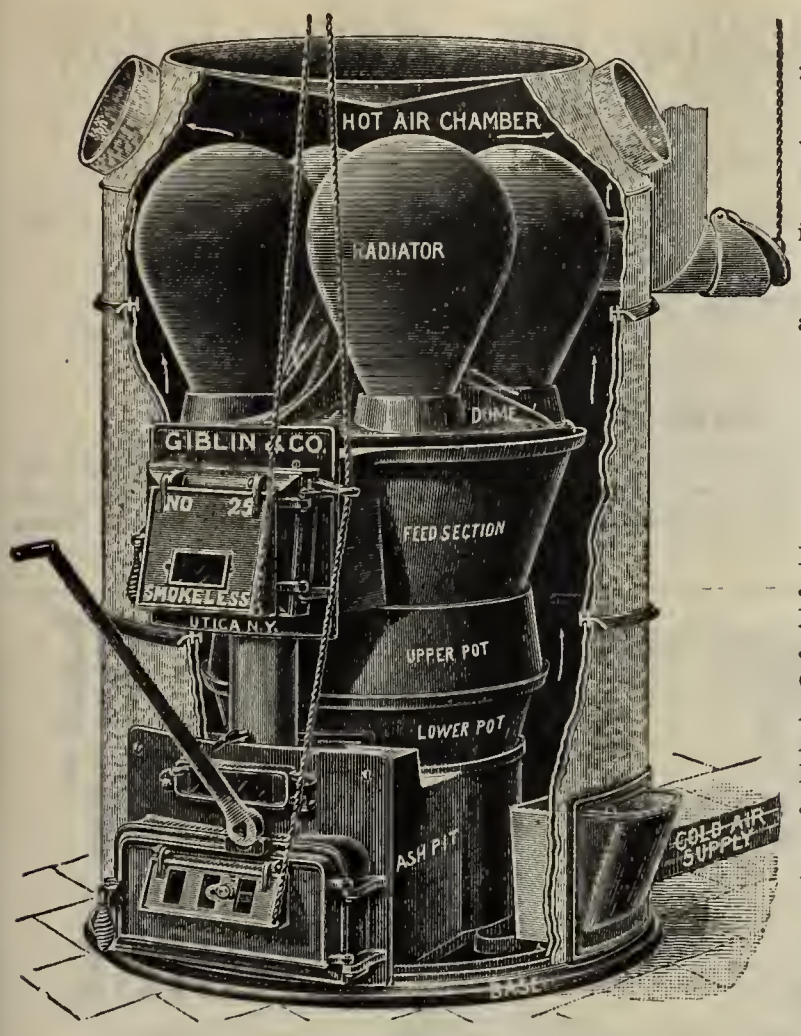
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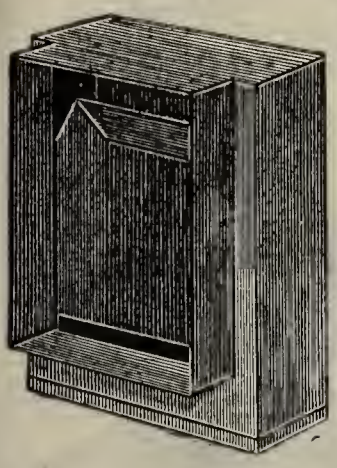
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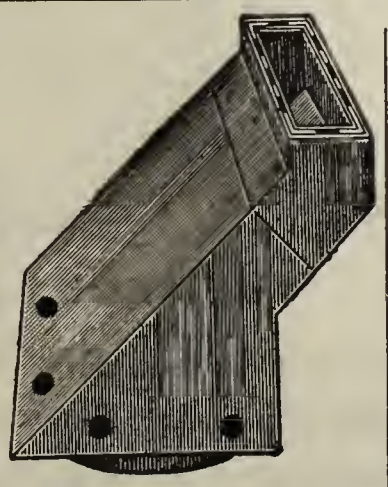
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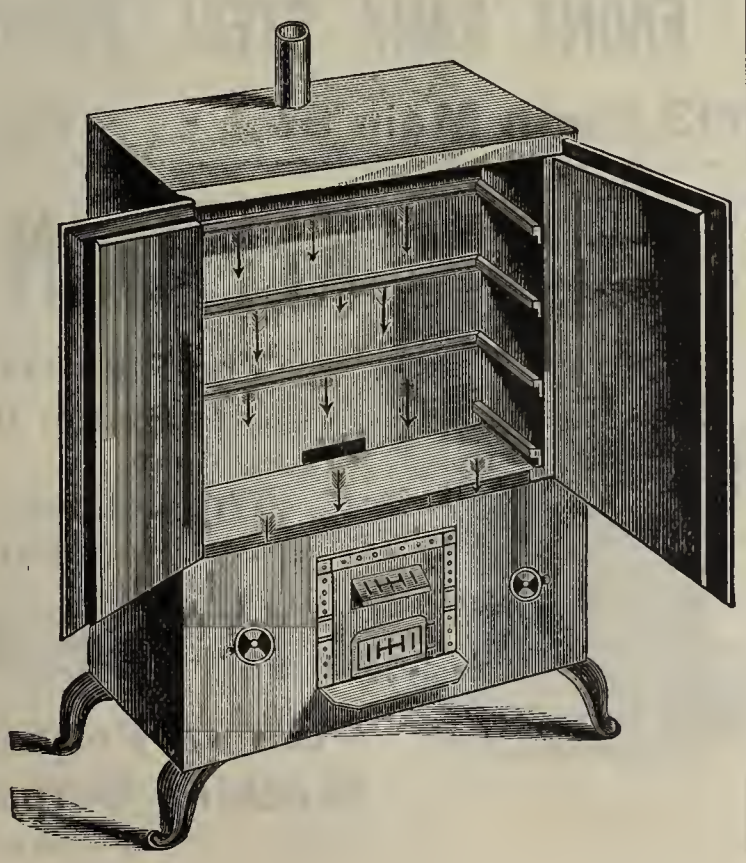
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"I never heard," said his Honor, gazing mildly at the respectable appearing prisoner, "that there was anything immoral in running a trunk factory."

"It's the noise," your honor. "People can't sleep in their beds at night."

"I never heard of a trunk factory running at night," remarked his Honor, blandly. "Will the prisoner please state the circumstances?"

"They are ladies' trunks, your Honor, made to order and with special instructions, which are a secret."

"Tell the Court all about it," suggested his Honor in a judicial voice.

"After they are finished and the name painted on they are taken to the roof of the factory and thrown into the court beneath."

"For what purpose?"

"To break the iron clamps at the ends and make dents in the side. If that process fails, I blow them open with dynamite."

"May I ask why such a remarkable method is used in the construction of your trunks?"

"It is to give them a traveled look, your Honor. They are for brides who wish to travel *incognito*."

The prisoner was discharged.—*Detroit Free Press.*

— Miss Porkopolis: "Is it true that all Bostonians live on baked beans?"

Mr. Beaconstreet: "Oh, no; lots of them live on their relatives."— *Somerville Journal.*

— Just Long Enough to Think it Over.—Patient Old Lady (to elevator boy reading novel): "How often does the elevator go up, boy?"

Elevator Boy: "It goes up at the end of every chapter, ma'am."— *Pittsburgh Chronicle Telegraph.*



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"Oh!" across the Atlantic, of course. Don't bother me; you made me forget my count."

"Does trans always mean across?"

"I suppose it does. If you don't stop bothering me with your questions you'll go to bed."

"Then does transparent mean a cross parent?"

Ten minutes later she was resting in her little bed.—*Detroit Catholic.*

— His Honor Convinced.—It has not been so very long since the old English court rules passed out of observance, and when they were in vogue nowhere were they observed more strictly than in South Carolina. A rule provided that a lawyer when he spoke in court must wear a black gown and coat and that the Sheriff must wear a cocked hat and sword. On one occasion a lawyer named Pettigrue arose to speak in a case on trial.

"Mr. Pettigrue," said the judge, "you have on a light coat. You cannot speak, sir."

"Oh, your honor," Pettigrue replied, "may it please the court, I conform to the law."

"No, Mr. Pettigrue," declared the judge, "you have on a light coat. You cannot speak, sir."

"But, your honor," insisted the lawyer, "you misinterpret. Allow me to illustrate. The law says that the barrister must wear a black gown and coat, does it not?"

"Yes," replied the judge.

"And does your honor hold that it means that both gown and coat must be black?"

"Certainly, Mr. Pettigrue; certainly, sir," answered his honor.

"And the law further says," continued Mr. Pettigrue, "that the Sheriff must wear a cocked hat and sword, does it not?"

"Yes, yes, Mr. Pettigrue," the court answered somewhat impatiently.

"And do you mean to say, your honor," questioned Pettigrue, "that the sword must be cocked as well as the hat?"

"Eh?—er—h'm," mused his honor. "You—er—continue your speech, Mr. Pettigrue."—*Louisville Courier-Journal.*

— The Mirror up to Nature.—Cohen: "Oh, dot poy of mine git me so much droubles, he vos grazy to go on der stage!"

Rosenheim: "Vants to be dot Romeo und Chewliette, eh?"

Cohen: "Ach, it vos vorse den dot; he vants to be von of dose Irish gommedians!"—*Puck.*



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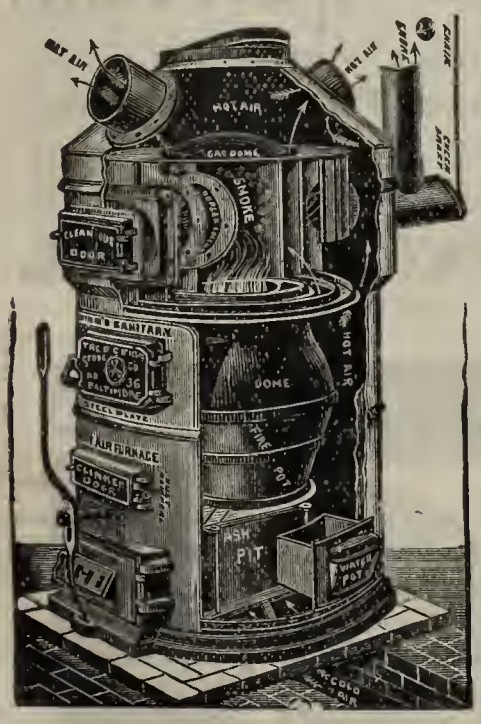
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GENTLEMEN.—We take pleasure in testifying to the merits of the Kernan Smoke Consumer Furnaces. You are aware we have sold a large number of these heaters during the past three years, and we believe they are not equaled for Soft Coal. Our success is surprising to ourselves, and we now believe our sales for this season will be largely in excess over any previous year's. The introduction of superheated air at the very point of combustion causes the gases to ignite at once, thereby preventing the formation of soot, causing thorough combustion and intense heat. This furnace requires no more attention than a hard coal heater and is decidedly less expensive in fuel.

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For Steam or Hot Water.

THOUSANDS IN USE

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— STRICTLY BUSINESS —"I—I hardly know what to say, Mr. Browncliff," said the agitated young woman who acted as assistant postmaster and grocer's clerk at the little village of Peaville. "I—I wasn't expecting anything of this kind."

"That's all right, Miss Frankie," responded Mr. Browncliff, traveling salesman for Pullem & Gummit's candy factory. "That's all right. You can just consider it a square offer. I have a good house and lot, $2000 in the bank. I'm getting a handsome salary, I am a good judge of girls, and you're the one I want to marry. I've got just five minutes to make a train, Miss Frankie," he added hurriedly, looking at his watch, "and I'll be round again in exactly thirty days for your answer with a full line of samples—save your orders for me and think over what I've said, and I haven't another second to spare; good by, dear."—*Chicago Tribune.*

— THE WEATHER FORECAST.—He entered the meteorological service office and said abruptly, "This 'ere's where you give out weather predictions, ain't it?"

The clerk nodded.

"Well," continued the old man, "I thought as how I would come up an' give you some tips."

"Yes," said the clerk politely.

"Yes. I've figured on it a little, an' I find that ye ain't al'ays right."

"No; we sometimes make mistakes."

"Course you do. We all do some time. Now, I was thinkin' as how a line that used to be on the auction handbills down in our county might do fust rate on your weather predictions an' save you a lot of explainin'."

"What was the line?"

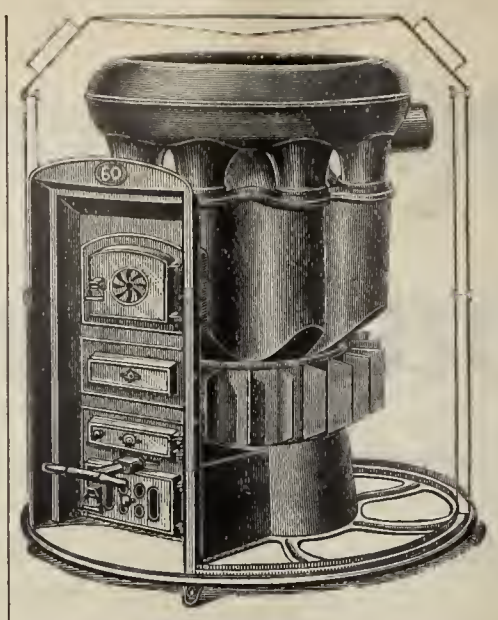
"Wind an' weather permittin'."

He went down without waiting to say good-by.—*London Tit Bits.*



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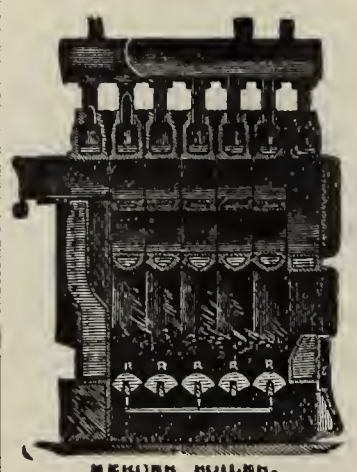
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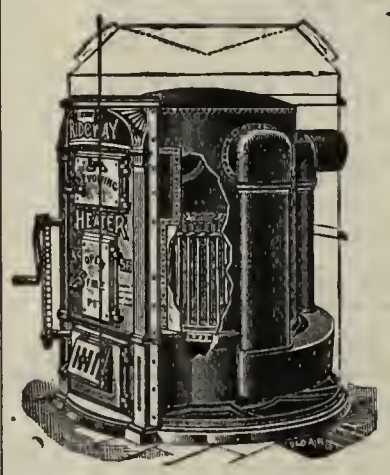
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—AND—
NASHUA, - - - N. H.



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— Mrs. Wickwire: "What is the use of standing there and calling the stove names? That won't make the fire burn any better."

Mr. Wickwire: "I thought maybe if I could insult the blamed thing it would get hot about it."—*Indianapolis Journal.*

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MADE UNDER THE GAITLEY PATENTS.



POKERS, LID LIFTERS, SHOVELS, FIRE SETS.

Are good sellers. Send for prices to Hardware Jobber.

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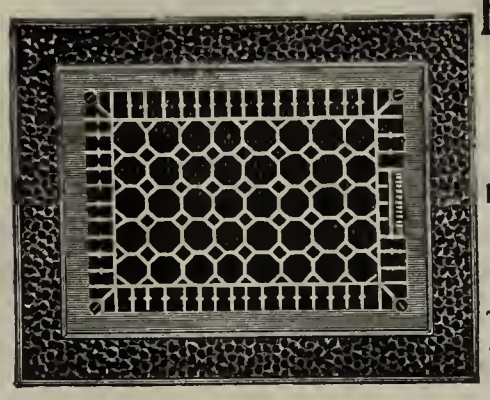
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Strong.

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Diameter,	1½,	1¾,	2.	2¼,	2½,	2¾,	3,	3½,	4 inch.
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Aluminum Bronze.

Foreign exchanges report that H. N. Warren of Liverpool, England, has been experimenting with aluminum bronzes, and has found that the presence of a very small admixture of boron makes a denser and more durable alloy. This aluminum boron bronze casts and melts well and is free from some drawbacks met in working with the ordinary aluminum bronze. Producers of that alloy often complain of the difficulty experienced in obtaining a uniform mixture, for a difficultly fusible alloy sometimes forms on the surface of the molten portion, and being accompanied by surface oxidation, refuses to alloy with the remainder. The aluminum boron alloy forms at a lower temperature than when pure aluminum is used. In preparing this bronze Mr. Warren first makes ingots of aluminum containing boron in the same state in which graphite exists in cast iron. These ingots are made by introducing aluminum into a molten mixture of fluorspar and vitrified boriex anhydride which has been heated in an oxy-hydrogen furnace until fumes of boron-fluoride appear. The boron is immediately reduced and it dissolves in the aluminum and the aluminum is rendered crystalline and brittle thereby. When added to copper in the proportion of 5 or 10 per cent. it forms the aluminum boron bronze in question, which is not brittle. The effect of boron on the bronze would appear to be quite different from that of silicon, which generally ruins all bronzes when present, even in minute quantities.

— LADY: "Ah, how fortunate that we should happen to meet you, doctor. Do you know we have been suffering for some time from—from—I think you term it congestion of the brain, and besides, we experience great difficulty in walking. What would you advise us to take now?"

Doctor: "A cab, ladies, a cab."—*Dagens Nyheter.*



No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8½ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

Dealers who Handle B. & B. STOVES

Make Money at Both Ends.

There are no old relics or fossils in the B. & B. line.

B. & B. STOVES ARE ALWAYS AHEAD.

Our competitors try to imitate, but the race is too rapid for them.



No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozen in box. Weight, 85 pounds. Height, 8½ inches. Size of Tank, 5½x5¼. NICKEL FRONT. Two 4-inch wicks.



No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozen. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8½ inches. Size of Tank, 5½ x 8½ inches. NICKEL FRONT. Three 4-inch wicks.



No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.



No. 8. B. & B. Cook Stove.

Nickel Finish. List Price, $3.50. 7½ inch double thick circular wick.

THE GLAZIER STOVE COMPANY. TRADE MARK B&B OIL & GAS STOVES BRIGHTEST AND BEST. CHELSEA MICH.



No. 6–3 B. & B. Cook Stove.

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B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**

It will pay you to consider these points.

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, June 9, 1894.

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Index to Reading Matter.....Page 51.

Bidding for Work.

The great waste of time and labor by the unsuccessful bidders in making estimates of cost on plumbing work from plans and specifications is a matter that is receiving increased attention. The interest is not confined to any one locality, and the master plumbers of New York in their meetings have given it serious consideration. The reason of this wasted energy is easily pointed out, for there are a number of plans of buildings that are open for bids at the present time, each one of which finds many firms ready to make an estimate. Architects' offices are watched carefully by all builders who have ever done any work for them, and in consequence all plans are figured on by many different contractors. As in other lines, builders devote themselves to specialties, but not being busy at the present time they are eager to be employed on any character of work; consequently, an architect who has had as many as 20 or 30 different builders working for him is now besieged by all for an opportunity to figure on each set of plans he makes. From the fact that these men have previously been devoted to special lines of buildings, dwelling houses, churches or factories, as the case may be, the sub-contractors to whom they apply for bids are not the same in any two cases: and, moreover, three or four bids are often asked from each division of sub-contractors. In this way it will readily be seen that as many as 80 or 90 bids might be made for a piece of work which, perhaps, is not worth over a thousand dollars.

Taking Advantage of Bidders.

The disposition to get the most for the money in these times is shown in a case which recently transpired in an architect's office, where over 20 bids were received for a complete contract. Later it was decided to reserve a portion of the work, and with the tabulated bids exposed to the contractors they were asked to make amended bids, leaving out a specified portion of the work. It can readily be seen that the highest bidder in making an amended bid under such circumstances would be tempted to go below the figures of the lowest bidder. Some of the contractors refused to make a second bid, and others say they will never again figure on plans coming from that office. If a job is of any considerable size, the preparation of an estimate will occupy the time of a master plumber at least a week, if he devotes himself to it alone and makes a careful account of the cost, and assuming that his time is worth but a little more than a journeyman plumber, his week's labor would amount to $30. In a case where there would be 70 different plumbers making an estimate for such a contract, it can readily be seen that the cost of the bids furnished would be about $2100, which probably would be more than the price of the job, to say nothing of the profit. It is stated that in making bids in this way the reputation of a plumbing firm for doing excellent work in the most careful manner, and with only first-class materials, counts for nothing; that while the owner of the building would greatly prefer to have none but men in whom he could place confidence figure on the work, the system permits men who are incapable and unreliable to figure and stand an equal chance of securing the work. Competition was asked a short time since for the plans and specifications of a building to cost $1,000,000, for which a $50,000 prize was offered, and, as a result, 189 competitors took part. It is fair to suppose that a man competent to draw the plans and write specifications for such a building would occupy at least one month's time in the work, and in the aggregate 189 months were consumed, or 15 years 9 months. It is also fair to suppose that a man capable of doing such work would be worth a salary of $3000 or $4000 a year, at a low estimate, or $300 a month, which makes the value of the time for working out these plans nearly $57,000. The prize awarded to the successful bidder was, as stated, $50,000, which would not nearly pay for the time spent on the plan.

The Lottery Feature.

Lotteries are prohibited by the Government, yet in the case cited 189 men are striving for a $50,000 prize, each with one chance in 189 of being successful. It has been suggested that architects in charge of buildings of any considerable size should see to it that only good contractors are permitted to bid on the different parts of the work, even though the contract may be let as a whole. If the architect were to name a select number of heating contractors, plumbing contractors, roofing contractors, and so on through the whole list, who would be called upon for bids, not only would his client be better served, but much injustice, or at least needless waste of energy, would be avoided. It is said that the plumbers in one of the large cities of Rhode Island have made an arrangement with the architects by which every plumber who bids on a set of plans is paid for the time spent in preparing bids in proportion to the amount of work to be done. In this way the architect is careful to select only such men as he thinks are fitted to do his work well. The successful competitor has the amount which he has been paid for making the bid taken from the price of the work which is awarded to him. The other bidders retain the money which has been paid them for furnishing the bids. The plan, we understand, has worked very satisfactorily and is worthy of consideration. It must be borne in mind, however, in adapting any strict rules in this matter, that young firms are constantly pushing ahead, and it would be wrong to deny them a chance to bid against the established houses in the business and so win for themselves the advanced reputation and position they are seeking.

The Proposed Class in Sheet Metal Work.

Professor Richards of the Pratt Institute, Brooklyn, has received up to date about a dozen applications from candidates for the proposed class for sheet metal work in connection with the Trade School of the institute, to which reference has several times been made in these columns. A number of inquiries from prospective candidates have also come in, some of which will, it is hoped, result, later on, in definite applications for instruction. We understand that the prospect is bright for the establishment of this new branch of trade school work. Those who intend to avail themselves of an excellent opportunity of securing a thorough education in sheet metal pattern cutting should not, however, delay in sending in their applications, as the opening of the class will depend entirely upon the extent of the interest shown in it by the trade. A few more pupils must be secured before definite action will be taken in the matter. The Trade School will open in September, but applications are desired as early as possible, so that the necessary preparations may be taken in hand.

Importations of foreign bituminous coal continue. During the week cargoes have been received at New York from Wales and Nova Scotia.

THE LETTER BOX.

Automatic Ventilation of Dwellings.

From B. N., *Minneapolis, Minn.*—It has always been a source of surprise to me, in looking over the literature pertaining to hot air work, that so little is said by manufacturers and writers in general on the subject of ventilation. My opinion is that if this matter was given more attention there would be less complaint about hot air furnaces, provided, of course, that the furnace had enough heating surface to warm the air. In this locality we are forced to use ventilating devices in connection with hot air furnaces or they would not give satisfaction. Here nearly every house of the better class is back plastered, has matched sheathing and building paper under the clapboarding, is fitted with double windows and provided with storm doors or vestibules. We build as nearly air tight as possible, so that it is absolutely necessary for us to have an exhaust in order to maintain a circulation of air. Believing that what we have been obliged to do may be of benefit to hot air furnacemen in other localities, who sometimes strike knotty problems in heating to be overcome, I will briefly set forth our method of securing automatic ventilation and circulation.

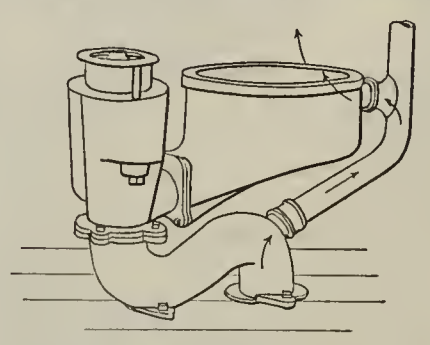
The method of which I write was introduced here some years ago by a Mr. Tilden, and is now used with various modifications by all of the leading hot air contractors. By this system the chimney flue of the furnace is made to serve the double purpose of furnishing draft for the furnace and an exhaust for ventilating pipes. For the purpose of illustration we will take a ten-room house, which is to be heated by a hot air furnace and ventilated. A large sized flue must be constructed for this purpose. It will not work if an ordinary 8 x 8 inch flue is taken. This would only furnish draft for the furnace and nothing more should be expected of it. The flue should be 12 x 16 inches, to make a really good job, in which to build an 8 inch tile stack as a special flue for the furnace. This heats the space around it into which the ventilating pipes are run. A good job, but not so permanent, can be done with a 12 x 12 inch chimney flue, with a 9 inch stack of No. 16 galvanized iron up the center for the furnace, with the ventilating pipes running into the surrounding space. Some very successful jobs have been put in with the ventilation running in the same flue as the smoke, but the flue in that case should be at least 12 x 12 inches, and a damper is required in the main ventilating pipe to shut off the air when starting a fire or when the draft is poor by reason of atmospheric disturbances.

Now, as to the arrangement of the ventilating pipes in the house. These are of tin and are usually 3¼ inches in diameter. They run from the baseboard of each room to the cellar, with 4½ x 6½ inch faces at the baseboard. In the cellar they connect with a main pipe which runs to the chimney. This is done when one flue is used for both smoke and ventilating. When the ventilating shaft is separated from the smoke flue, the vent pipes are run independently to the ventilating flue by short connections on each floor. By this arrangement an automatic system of ventilation and circulation is secured, which begins to operate as soon as a fire is kindled in the furnace, creating an upward draft in the chimney.

If the house is built with only an 8 x 8 inch flue for the furnace it should not be used for ventilation. In such a case the ventilating pipes should be run to the attic, connected into one main and run through the roof, because the flue is not large enough to serve for both purposes and the furnace will not heat on account of insufficient draft.

By-Passes: What They Are, and How to Avoid Them.

From OLIVER TWIST.—The word by-pass seems to belong exclusively to American plumbing literature, as it is seldom found in the works of authors



By-Passes: What They Are and How to Avoid Them.—Fig 1.—*A Water Closet By-Pass.*

from the other side of the Atlantic. Webster defines the word "by passage" as "a passage by the way or a by-way." As applied to plumbing practice it means a blunder in the arrangement of traps and vent pipes in a plumbing system by which the sewer gas is allowed to pass the trap and thus escape into

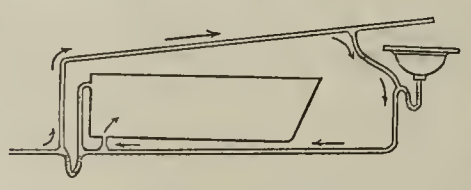


Fig. 2.—*By-Pass Between Bath and Lavatory.*

the building. Local vents or vents from the hoods of urinals, the bowls of water closets, &c., are frequently the cause of the trouble, as they are often found connected to a trap vent, as shown in Fig. 1. A similar case was seen by the writer not long ago in connection with an expensive closet of the elevated flush tank variety, having a bowl vent which was particularly desired by the owner as a sanitary measure, and yet it was allowed to be attached to the soil pipe above the highest fixture, being practically the same as Fig. 1. These vents, of course, should have been carried up separately through the roof, or to the open air. If the water from a fixture passes through more than one trap on its way to the house drain and both traps are vented there is sure to be a by-pass, as may be seen in Fig. 2. As a general rule every fixture should be furnished with a separate trap placed as near the fixture as is practicable. All traps are better if vented, even if they are of the anti-siphon pattern, as a trap that is not vented has a dead end which accumulates sewer gas, having a very corrosive action, which materially lessens the life of a trap. Laundry tubs are an exception to this rule, however, as they are usually allowed, when placed in series of two or three, to be protected by one trap. Vent pipes should be connected to the crown of the trap in all cases and on the sewer side. The word by-pass is also used in speaking of a branch taken from a water pipe, as stated in the answer to "A. J. C.," in *The Metal Worker* of May 5.

Problem in Drainage.

From M. J. F., *Minersville, Pa.*—I would like to hear from the readers of *The Metal Worker* on the following subject: I want to run a drain pipe to creek which is 2 feet lower than the bottom of the cellar. The stream flows about 8 miles an hour. The question is, if I run a drain with the stream is there enough suction to keep the cellar dry when the water in the creek rises 2 feet above the level of the bottom of the cellar?

Note.—We submit this question hoping to hear from some of our readers who have had experience where the conditions were similar. The natural supposition is that water will rise to its level and if it was 2 feet higher in the creek than in the bottom of the cellar it would seem that the water would rise in the cellar to the same hight, but as the high velocity of the current will produce considerable suction a different result may be possible.

Utilizing Surplus Heat.

From F. L., *Baltimore, Md.*—I have been interested in the article of "Experimenter" in *The Metal Worker* of May 26, on heating a room over the kitchen from a range with a horizontal boiler. I would like to have some information on the subject, as I have a room to which I should like to carry hot water heat by connecting with the boiler, but I have an upright boiler. Will you kindly inform me whether I can take hot water from the top of the boiler, or if it is better to take it by a branch at the side coupling? Should the return from the radiator be connected with the cold water supply at the top of the boiler or with the pipe from the bottom of the boiler to the water back?

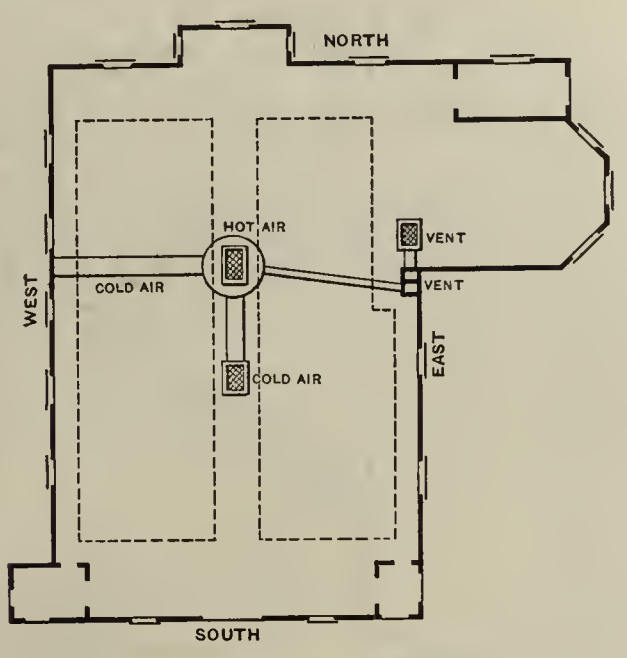
Answer.—The first thing to be considered in heating from a range boiler is whether the water back has sufficient

capacity to heat the extra amount of water required. This being decided, it is an easy matter to pipe the job. The hot water flow pipe to the radiator may be connected either with hot water service pipe at the top of the boiler or by means of a branch at the side coupling, as preferred. There are some advantages in connecting at the top of the boiler. The return pipe from the radiator should always connect with the water back pipe between the bottom of the boiler and the water back. The radiator should have an air cock at the top to let the air escape as the radiator is filled. A stop cock should be put on the pipe that leads to the radiator to prevent the radiator being heated in the summer when no heat is desired.

Wants a Better System.

The letter from "CÆSAR" is reprinted with some additional comments which came in later, as his plan, by an error, was separated from his letter in *The Metal Worker* of June 2.

From CÆSAR, *Louisville.*—In *The Metal Worker* of May 12 I note an article from "W. S. G.," Penbrook, Pa.



Wants a Better System.—Plan by Cœsar.

The only comment necessary is that "W. S. G." did not roast the architect sufficiently. The plan offered by the latter is well calculated to heat cellar to about 100° and auditorium 40° to 50°. As this is not desirable I offer the following with diagram of adjustment. I would place furnace as per diagram and take the hot air through a 30 x 36 face plate and border directly over furnace. Ten feet toward front of building I would place a register having three-fifths of the capacity of the hot air register and with pipe of three-fifths of the capacity of the hot air pipe, connecting it to a pit under the furnace. The other two-fifths of the capacity of the hot air register I would use in a pipe connected to pit under furnace and run to outside air. I would place vent register as designated and give both pipe and register the same capacity as the vent flue. Let "W. S. G." use faces and borders only on this job. Such a plant will heat this building with 25 per cent. of the fuel that would be consumed in plan offered by the architect. If "W. S. G." had done the proper thing in this case he would have firmly passed the job and refused to figure on it. It is not well for a heating man to waste his time on such jobs as the one offered, in which such dense ignorance of the laws governing warm air heating is displayed. It is my experience that it requires a full lifetime of close application to learn the entirety and details of our business, yet we find some people who after four or five years' experience have mastered the details of every business. Comment is unnecessary.

It will be noticed that there are but three registers on my plan and the sum total of the cold air must equal the total of the hot air. We have a church in this city that is 136 feet long, 47 feet wide, with a mean hight of 41 feet, that is heated on this basis with less than 400 bushels of soft coal for the entire winter, and there has been a continuous fire in one or two furnaces. If any good brother is inclined to doubt this statement the job is here and open for his inspection.

Front Wall Traps.

From S. F. G., *Washington, D. C.*—In reply to the query of "L. J. S.," in *The Metal Worker* of June 2, I wish to say, after having had an experience with front wall traps in house drainage of over 20 years, I hold that they do more harm than good where the building is properly plumbed. They could be made serviceable if the vent to the top of the house were heated by gas or a hot flue, otherwise they are altogether a delusion. In this city they are mandatory and have caused no end of trouble. Their location and the method of putting them down have been changed by the inspectors many times, and the same may be said of the air inlet, which proves my assertion. Until the vent pipes are heated to force the current of air in the proper direction their purpose will be very doubtful.

From J. O. C., *Summit, N. J.*—In reply to the inquiry of "L. J. S.," New York, in regard to front wall traps, that appeared in *The Metal Worker* June 2, I would say that I am a plumber and an advocate of the trap and fresh air inlet at front wall. But instead of inside I would much prefer it on the outside, set in a brick wall with flagstone ever it, with manhole and cover and the trap to have a brass trap screw, so it can always be readily cleaned. This trap, the main trap as it is most always called, I think is an indispensable attachment to a plumbing system. To be sure it adds considerably to the cost when properly put in, but in the long run it pays for itself. When the fresh air inlet is carried 20 to 30 feet from the house, as is the case here, I fail to find any bad smells coming from it, as I don't think the flushing of any fixture in the house, with the fresh air opening 20 to 30 feet away, is sufficient to force the bad air out before a reverse action takes place and carries it, with fresh air, out at the roof.

We may take the most secure cast iron plumbing job or soil pipe and in time, owing to the expansion and contraction of the joints, it would be unable to stand the water test, thereby leaving openings for the escape of sewer gas, which would be remedied in a great measure by the main trap and fresh air inlet at the front wall. In cases of split hubs and sand hole pipe and jobs that have never stood the water test, the trap becomes an important factor, or in cases of tile pipe that has been laid with the cement joints not cleaned out and leaving rough edges inside the pipe, which hold and accumulate filth, I consider the trap a great benefit.

As the fresh air acts as a purifier, and its constant circulation through the system serves to keep the system in sweet and good order and free from any disagreeable or poisonous gases, I do not see how it can be dispensed with. In cases of repairs also where a closet or a fixture has to be so opened that the waste pipe is left open without any trap in direct connection with the room, the main trap and fresh air inlet performs an important office. As for me, I fail to see any good argument for not putting in the main trap and fresh air inlet outside front wall. It presents itself to my mind as a question of sewer gas or fresh air, and I much prefer the fresh air, which has led me to recommend at every opportunity the main trap and fresh air inlet, and I always feel that I have done my duty as near as possible from a sanitary standpoint by doing so.

Cement for Glass.

From W. P. E., *West Branch, Mich.*—Will *The Metal Worker* or some of its readers please give me the receipt for a preparation that will cement glass to tin for cream can gauges? I have tried a good many things, but without success. I can get them to hold for a short time, but when they are scalded and cleaned they begin to leak.

Note.—We trust this appeal to our practical readers will secure our correspondent the assistance he wishes. From one of the workshop receipt books the following is taken for uniting glass and metal: Melt carefully 160 parts, by weight, of finely pulverized collophony; 40 parts of white wax and 80 of colcothar. Add to the melted mass 20 parts, by weight, of Venetian turpentine. Remove from the fire and stir cement until cold with a wooden spatula. Apply the cement when warm.

THE METAL WORKER SKYLIGHT COMPETITION.

Second Prize Essay.

BY JOHN C. DRESSEL.

In making a metallic skylight, the mechanic has the same general problems to contend with that a carpenter has in constructing a hipped roof and laying out the various rafters for the same. The carpenter has a plate or foundation to start with, and the different rafters, which he terms the common rafter, hip rafter and jack rafter. So in constructing a skylight we will be compelled to impose on

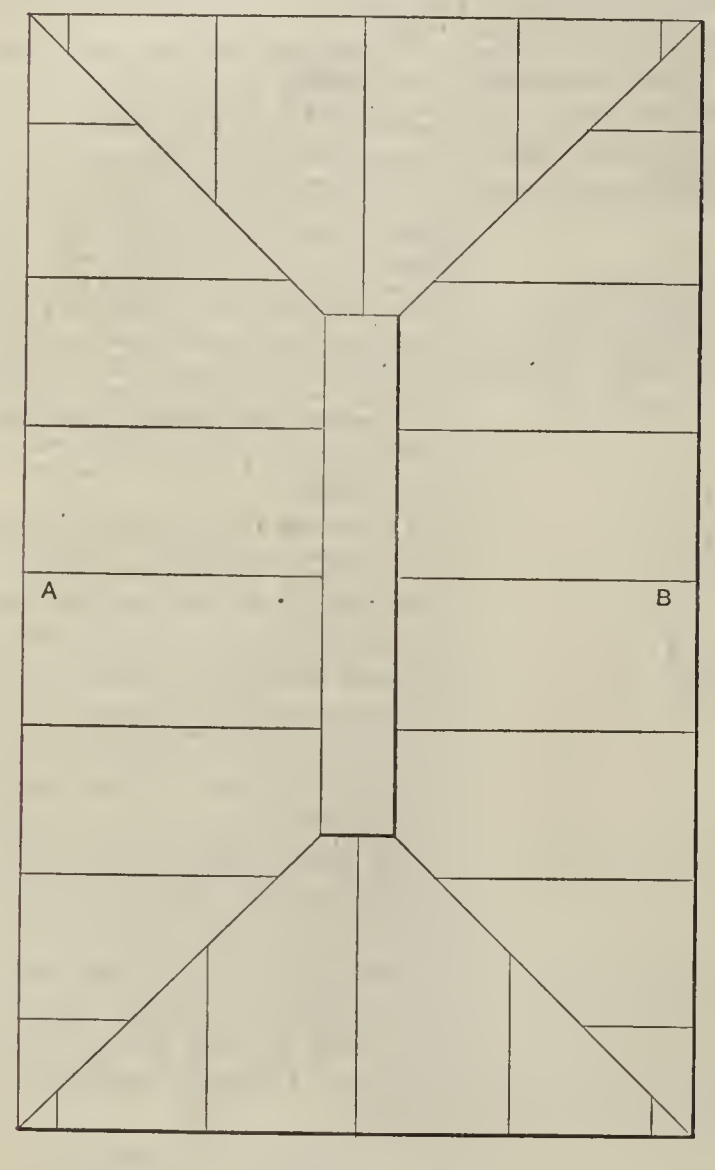


Fig. 1.

some of our carpenter friend's good nature and borrow a few of his familiar terms. Instead of using his plate we have substituted the word "curb," which will be the foundation for starting to build a skylight. Instead of using his rafters we will use bars, hence we have common, hip and jack bars.

The Metal Worker did not require a ventilator skylight, but as skylights are for the purpose of giving light in dark quarters, as dark places usually accumulate moisture, and moist places disease, there is a necessity for ventilation. We have, therefore, submitted plans and patterns for a ventilated skylight, as the same general steps are necessary to produce a light with a plain ridge as a light with a ventilator.

Let Fig. 1 be the plan of a skylight which it is desired to build.

Fig. 2 represents a sectional elevation of Fig. 1 on line A B, the pitch of the light in this case being one-third pitch.

Fig. 3 shows profile of curb bar. It will be noticed by inspection that it is formed of one piece of metal and of such a shape as to form a trough.

The various bars are attached to this curb in such a manner that all condensation will empty into this trough. By punching holes where marked in Fig. 3 the water is allowed to escape to the outside of curb. These holes should be so punched as not to come directly opposite each other, and be about ½ or ¾ inch in diameter, and should

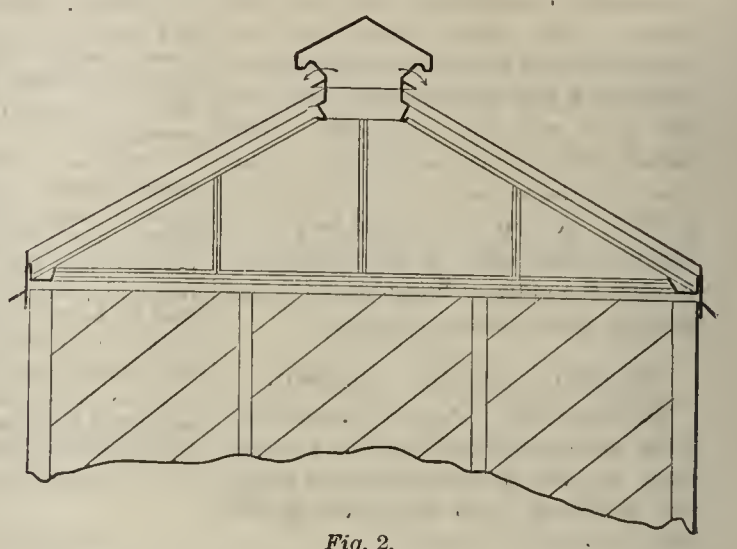


Fig. 2.

furthermore be punched before the metal is formed up. Also punch holes about ¼ inch in diameter at A to allow the escape of any water that may accumulate under the glass. These holes can be punched after the light is made up. The projection B is not really necessary, but it will be found an improvement, as it will throw the water out from the bulkhead underneath it. The manner of securing skylight to bulkhead is also indicated in Fig. 3.

Fig. 4 represents broken elevation of curb.

Fig. 5 shows profile of one of the common and jack bars. A B represents copper clip to be used in securing caps

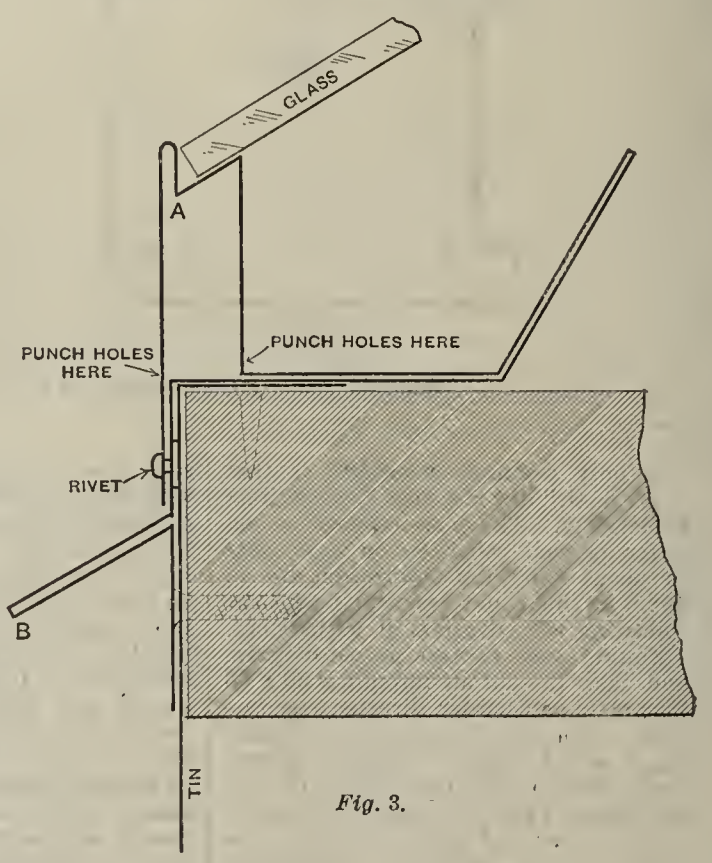


Fig. 3.

after the glass is in. The copper clip is made of sheet copper, about 14 or 16 ounce, and cut about 1½ x 2½ inches in size. The number of clips necessary to each bar is left to the option of the mechanic and as the case may require. Punch a hole, using a ½ or ⅝ inch chisel for the purpose, lengthways with the bar, and insert copper clip, as indicated by line A B, Fig. 5. By bending the ends of the cop-

per clip toward each other and hammering flat it will have the appearance of Fig. 6.

We are now ready for the cap. Let Fig. 7 represent profile of cap. Punch a hole, using same size chisel as for bar, or large enough to allow copper clip to pass through. The hole is to be punched at C, Fig. 7, and after laying glass on bar and then putting on cap we have in general appearance Fig. 8, of which Fig. 9 is a broken elevation. A B, Figs. 8 and 9, should be bent down so as to hug close to cap. It will be readily seen that in case of breakage a new glass may at any time be easily inserted by simply straightening the copper clip A B and removing the cap.

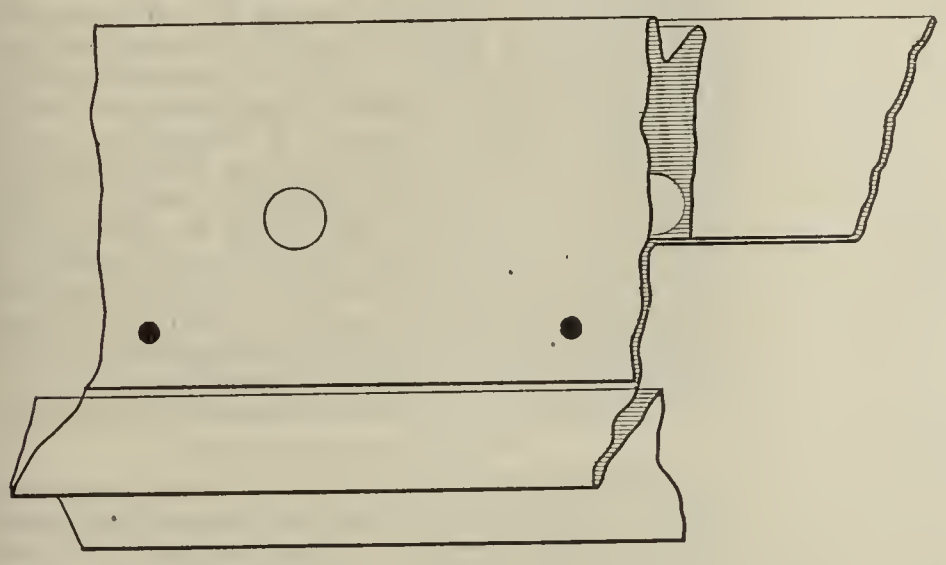


Fig. 4.

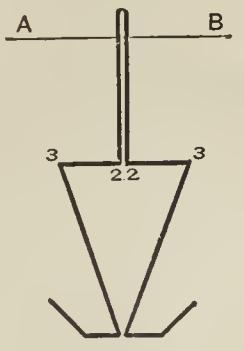


Fig. 5.

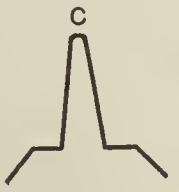


Fig. 7.

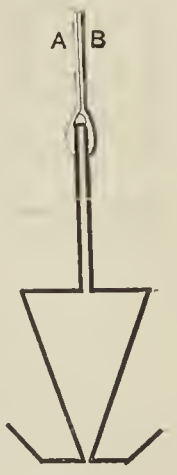


Fig. 6.

FINDING LENGTH OF BARS.

We are now ready to start getting out the light. Let us first ascertain the length of the various bars. Let A B E S T D, Fig. 10, represent one quarter of plan, Fig. 1, enlarged for convenience sake. At right angles to line A B lay off dotted line, as shown. On this line lay off the desired hight or pitch you wish skylight, in this case one-third pitch, as at C. Then A C will be the length of the common bars. Let me here mention that all measures are taken on the glass line. At right angles to D E lay off dotted line, as shown at F, making the space E F the same as the space B C. D F will therefore be the length of the hip bar. G H, J K, M N, P Q represent different jack bars, and H, K, N, Q where they intersect with hip bar.

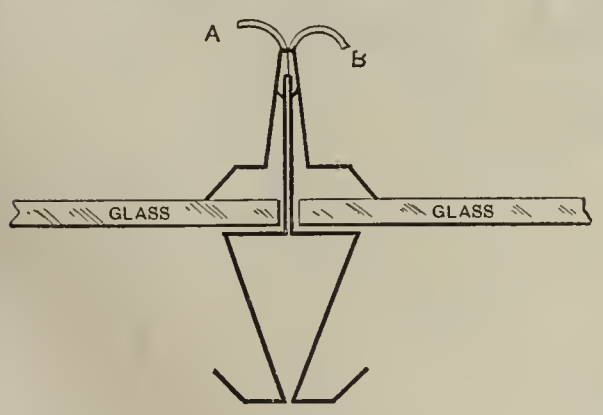


Fig. 8.

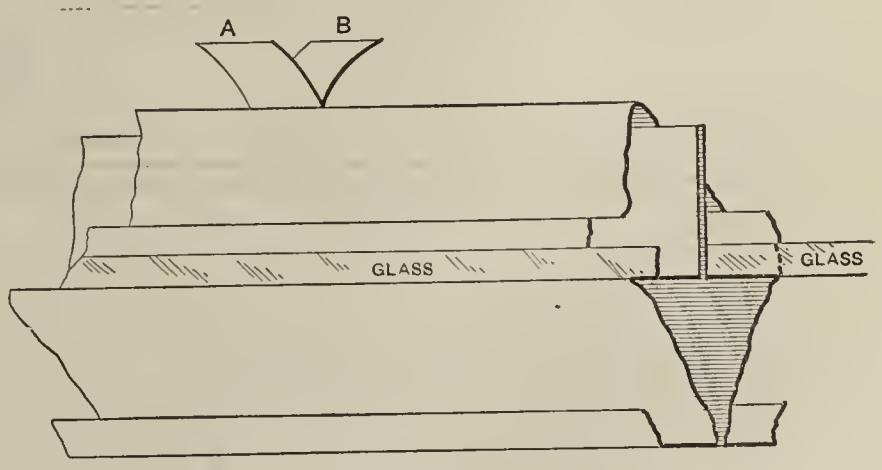


Fig. 9.

At right angles to hip bar, line D E, lay off dotted lines from H, K, N, Q until they cut line D F, as shown by I′, L′, O′, R′. At right angles to G H lay off dotted line I. With space equal to H I′ lay off H I, establishing point I. G I will therefore be the length of one of the jack bars. The lengths of the others are obtained in the same manner—that is, laying off dotted lines at right angles to jack bars where they intersect with hip line D E, and making the space K L equal to K L′, and space N O equal to N O′, and space Q R equal to Q R′. J L will be the length of one, M O of another, and P R of another of the jack bars.

LAYING OUT PATTERN FOR CURB.

Having now established the different lengths of the various bars, we are ready to proceed with the laying out of the patterns. Let us begin with the curb or foundation, numbering the various points of curb as shown in elevation, Fig. 11. The next thing we want is a plan to obtain pattern from. At right angles to base line 5 6 drop perpendicular line 7. At right angles to line 7, at any convenient point, draw line 7′, as shown; also drop perpendicular line 3. Parallel to line 7′, and with space between 7′ and 3′ equal to space between lines 7 and 3, draw line 3′, as shown. Then a line drawn as A B through the points where lines 3, 3′ and 7, 7′ intersect will be the necessary miter line. Drop perpendicular lines 8 6, 9 10, 1, 2, 4, 5, 13, 11, 12, cutting miter line A B, as shown. At right angles to perpendicular line 3 of elevation lay off stretchout of curb (1 to 13), as shown. At right angles to stretchout line erect perpendicular lines, as shown in pattern. Parallel to stretchout line drop lines from the various points obtained on miter line A B to their corresponding numbers on stretchout, as indicated by dotted lines. Then a line traced through the points thus obtained in stretchout will be the desired pattern.

As all measures are taken on the glass line (the glass line of curb is point 11), one would necessarily in this case want two sheets twice the length of A D, Fig. 10, with a miter on each end, also two sheets twice the length of D T, Fig. 10, with a miter on each end, measures being taken on line 11 of pattern.

The holes spoken of in Fig. 3 are shown on the pattern and should be punched as shown in pattern. The line X X

is merely to show what distance the holes are to be from the edge of the sheet, as will be readily understood by referring to Fig. 3.

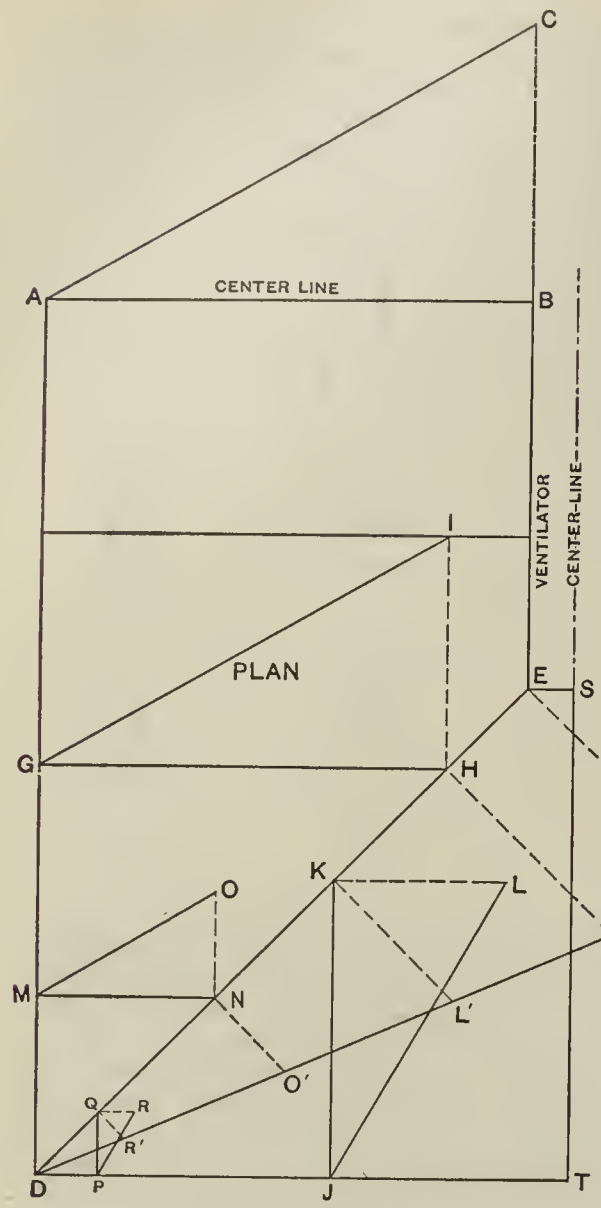


Fig. 10.

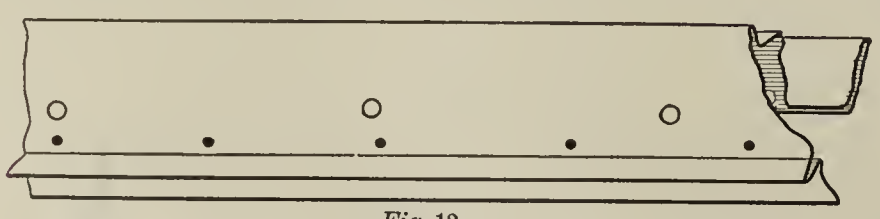


Fig. 12

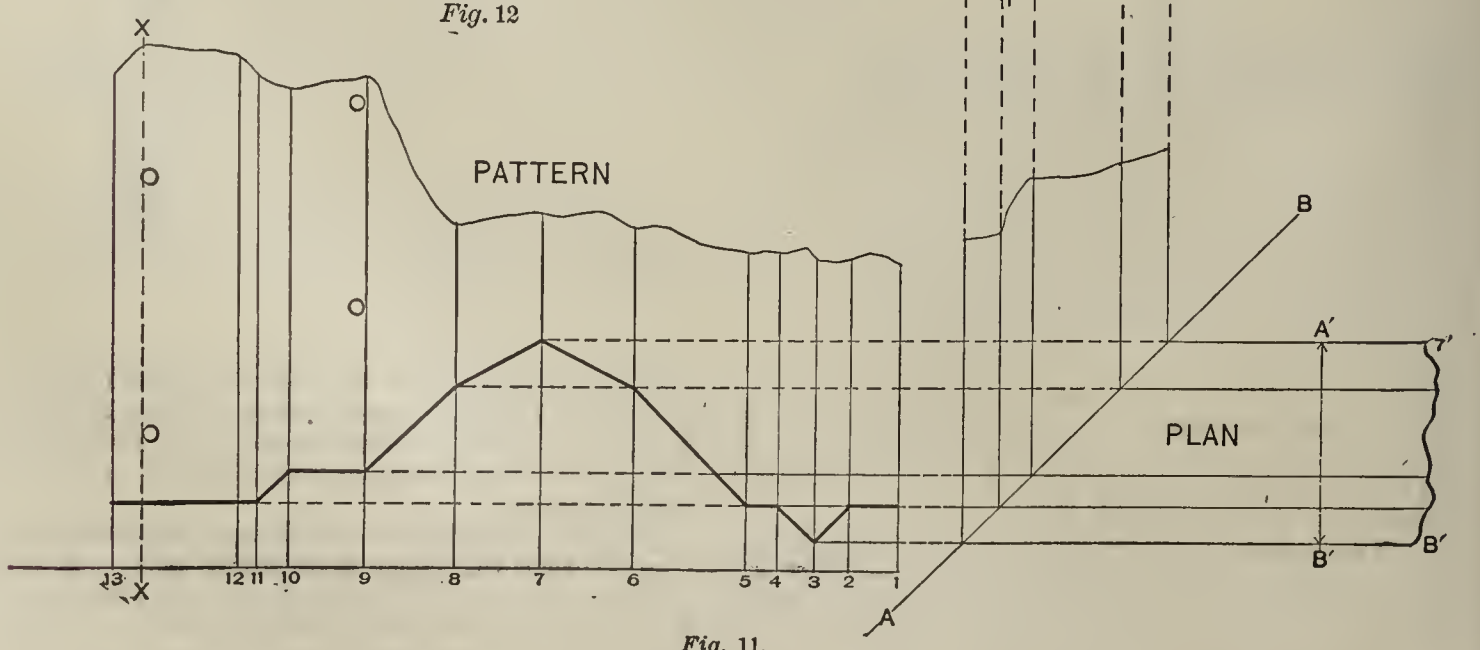


Fig. 11.

Fig. 12 again shows broken elevation of curb. It will now be necessary to have an elevation to correspond with plan of Fig. 10.

PATTERN FOR COMMON BAR.

In Fig. 13 draw line A B. At any convenient point, as at C, and at right angles to A B erect perpendicular line D, making space C D equal to space C B of Fig. 10. Also make space C E, Fig. 13, equal to line A B, Fig. 10. Then a line drawn from E to D would be the length of the common bars.

Point 11 of curb being the glass line, and the line D E being the glass line, place the profile of curb at E, as shown. At any convenient point and at right angles to line D E lay off indefinitely line F G. 2 3 of common bar, Fig. 5, being the glass line, place the profile of bar against line D E, as shown. Draw lines parallel to D E through the various points of bar profile until they intersect with curb and cut line C D, as shown. Finish drawing profile of ventilator, as shown, making glass line and condensation trough of ventilator equal to 2 3 and 4 5 of common bar. Lay off stretchout on F G, as shown. Draw lines through the various points of stretchout parallel to line D E. Then drop lines at right angles to D E, from the various points where lines of bar intersect with curb and ventilator to stretchout, as indicated by dotted lines, until they cut corresponding numbers of stretchout. Then a line drawn through the points thus obtained in stretchout will be the necessary pattern for one of the common bars.

Referring to Fig. 1, we find we want eight bars like this.

PATTERN FOR VENTILATOR.

Having the ventilator now close at hand we may as well get out the pattern for that before we proceed any further. Taking profile of ventilator produced in Fig. 13, and numbering the various points as indicated in Fig. 14, next draw center line indefinitely, as shown by line A B. On this line lay off stretchout 1 to 14, as shown. Through these points of stretchout and at right angles to A B draw lines indefinitely, as shown.

Then from the numbered points of profile drop lines to corresponding numbers in stretchout, as shown by dotted lines. Then a line drawn through the points thus obtained in stretchout will be the pattern for the end miters of sides of ventilator, point 5 being glass line. Therefore, a sheet

twice the length of E B, Fig. 10, with a miter cut on each end—that is, measuring on line 5 of pattern—will produce one side of ventilator ; or laying off the pattern on the opposite side of center line it will be found that line 5 is just twice the length of E S, Fig. 10, and, therefore, the pattern of one end of the ventilator.

C and C show side and end view of a brace, which is to be put in ventilator between the common bars. D, D represent holes for ventilation, and may be as large as the space between 8 and 9 will permit and as close together as may be desired. Fig. 15 shows broken elevation of ventilator made up. The vent holes should be backed with wire screen to prevent the entrance of insects, &c. This screen should be put on before the ventilator is put together.

It may have been observed before the reader has got thus far that these patterns are applicable to a skylight of any dimensions. The mechanic has therefore to be careful to make quarter plan, Fig. 10, to correspond with the size of skylight wanted, and make the incline of pitch the same in all cases ; or, if a different pitch of light is desired, the same general steps are necessary to produce the required patterns as are necessary in this case. The only difference would be that different profiles would be produced in the curb ventilator and hip bars. Therefore, if a light of a different size but of the same pitch as the one here submitted is desired, the mechanic would only have to shift his patterns to correspond to the different lengths of the various bars, the curb and ventilator, as would be

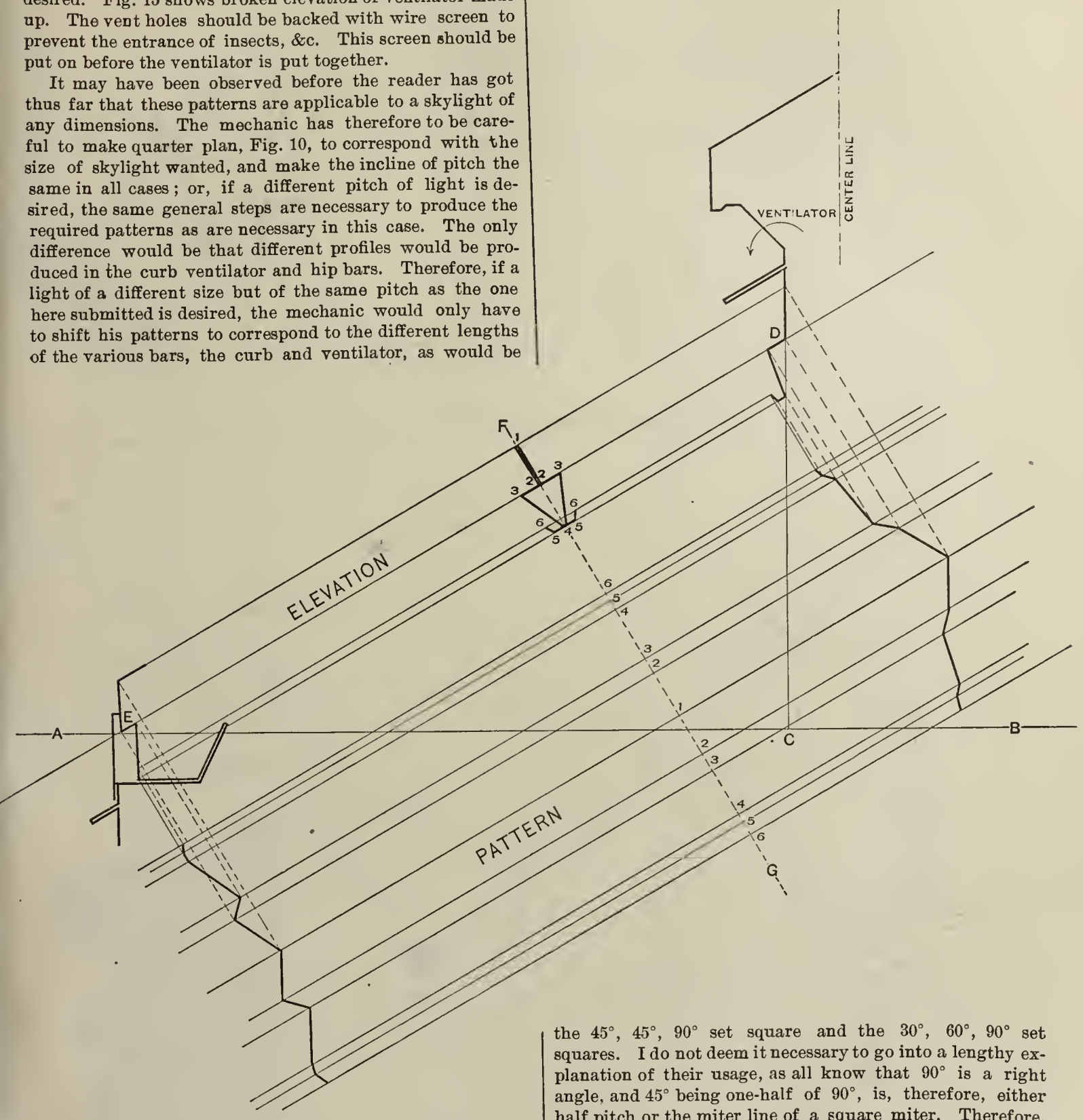


Fig. 13.

produced by a plan of a different size. The miters for the various parts will always be the same as they are in this case for the same pitch. Good judgment will therefore be necessary to make the various bars, &c., of sufficient size to carry the weight, which would necessarily be greater in a light of larger dimensions.

PROFILE OF HIP BAR.

We are now ready to produce the profile of hip bar. Fig. 16 shows the method proposed, it being drawn to correspond in size to plan, Fig. 10. Fig. 17 shows the same method as proposed in Fig. 16, the pitch in both cases being the same. Fig. 17 is drawn in detail, and as the same steps are necessary in both figures to produce the desired results, we will therefore use Fig. 17, as it will be the more readily comprehended.

Again draw elevation as in Fig. 13 (in Fig. 17 it being in detail), using only such portion of ventilator as the bars would come in contact with, as indicated by 1 2 3 4 5 6 of ventilator in Fig. 17. I believe most men who do this kind of work are accustomed to the use of the T-square and the various set squares that are used by draftsmen, such as the 45°, 45°, 90° set square and the 30°, 60°, 90° set squares. I do not deem it necessary to go into a lengthy explanation of their usage, as all know that 90° is a right angle, and 45° being one-half of 90°, is, therefore, either half pitch or the miter line of a square miter. Therefore, drawing line G H in Fig 17 at an angle of 45° to A B in elevation of same figure, we have center line of hip bar, as represented by line D E of Fig. 10.

At right angles to A B of elevation drop lines to G H in plan, as indicated by dotted lines, using only such portions of curb bar as would be required to find where hip bar would intersect with curb in plan ; also drop lines to G H, as indicated from ventilator bar. We therefore have one-half of plan. To produce the other half, lay off at right angles to lines 9, 10, 11, 12 of curb and 1, 2, 3, 4, 5, 6 of ventilator where they intersect with line G H of plan, drawing balance of plan as shown on right side of line G H.

At any convenient point draw line K L, as shown in plan, at right angles to G H. Now we necessarily want the same bearing for the glass to rest on on hip bar as we have

on the common bars. Therefore we have G H in plan as center line of hip bar, and I J in elevation as center line of common bars. Transfer the spaces 2 3, 4 5, 5 6, using line I J as center, to K L of plan, using line G H of plan as center. Through the spaces thus obtained on K L of plan, and parallel to G H, draw lines 5, 6, 3 until they intersect with plan of curb and ventilator, as shown, extending lines 3, 6 of hip bar through line 9 10 of curb bar in plan until they cut line 11 12 of curb bar.

At any convenient point and parallel to line G H of plan draw line A′ B′. At right angles to G H draw from point S the line cutting A′ B′ at S′. Also at right angles to G H of plan draw line, as shown, from point T indefinitely. With space equal to B D of elevation lay off from the line A′ B′ of diagonal section the point D′. Then a line drawn from point S′ to D′ would be the glass line of hip bar. Next draw line 5′ 6′ parallel to A′ B′, as shown in diagonal section, making the space between line A′ B′ and

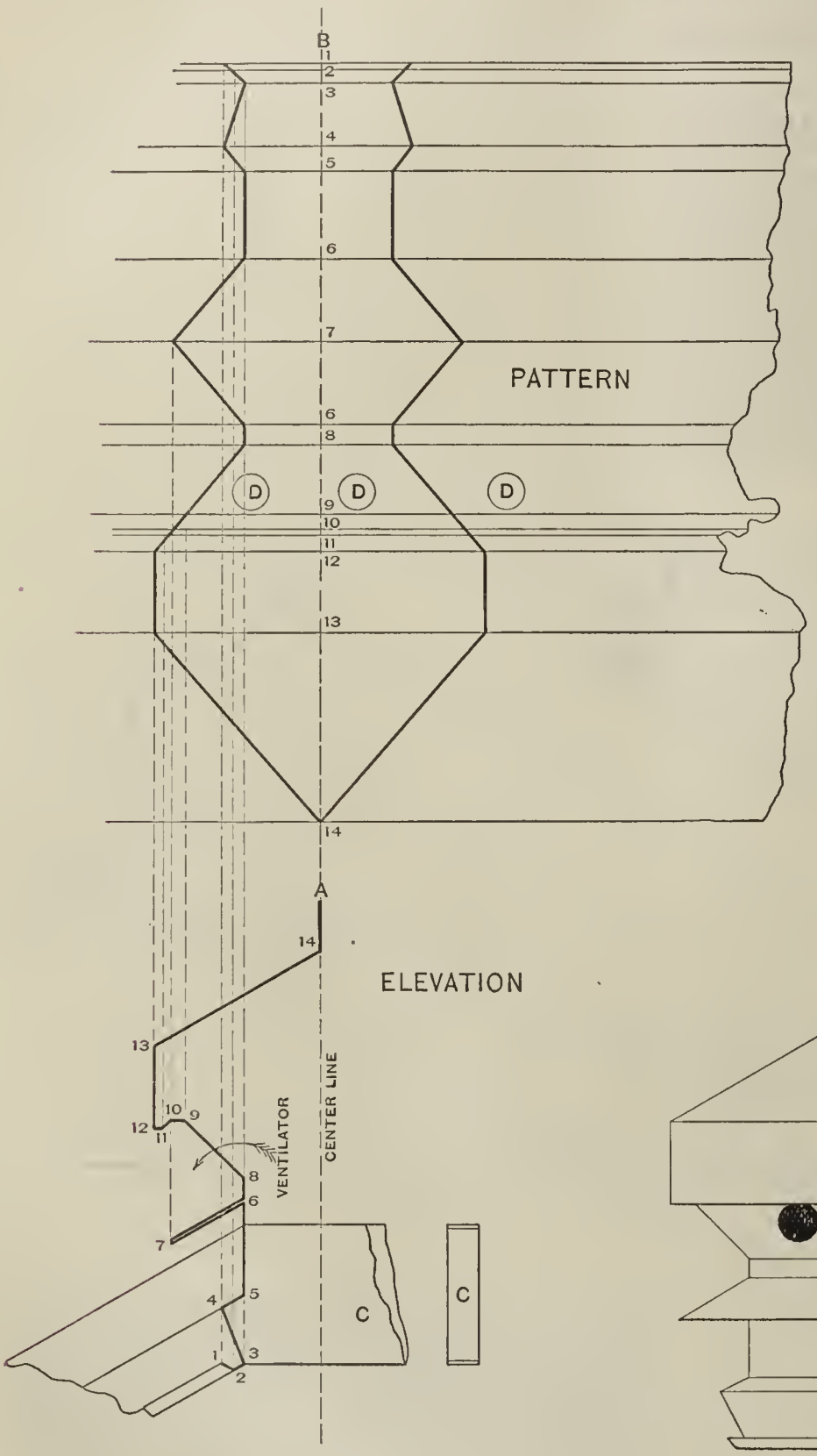


Fig. 14.

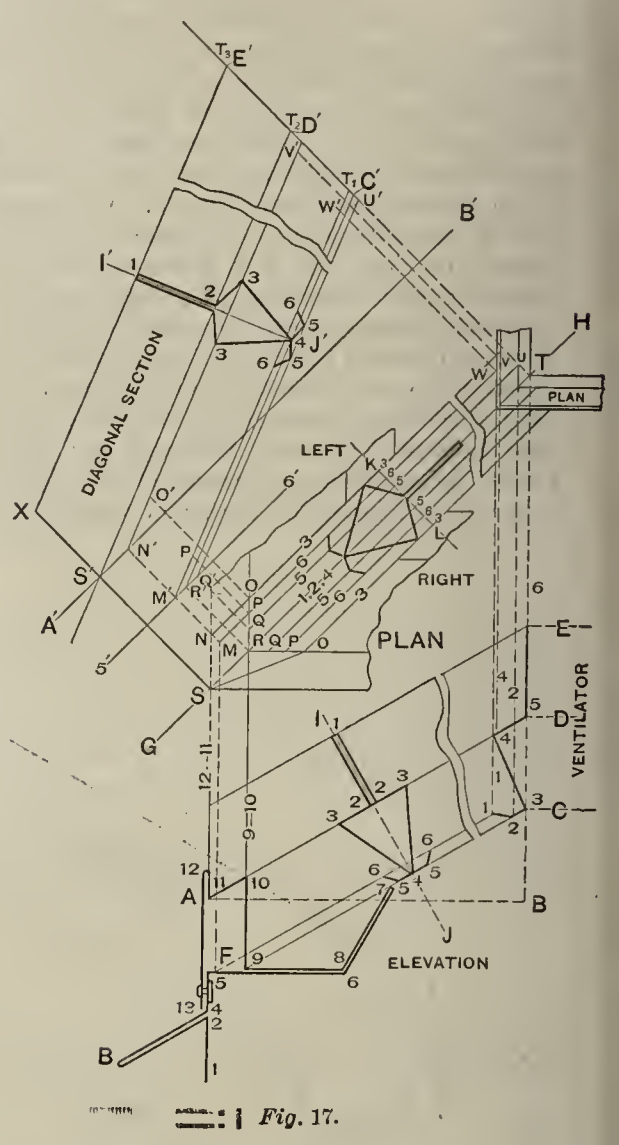


Fig. 17.

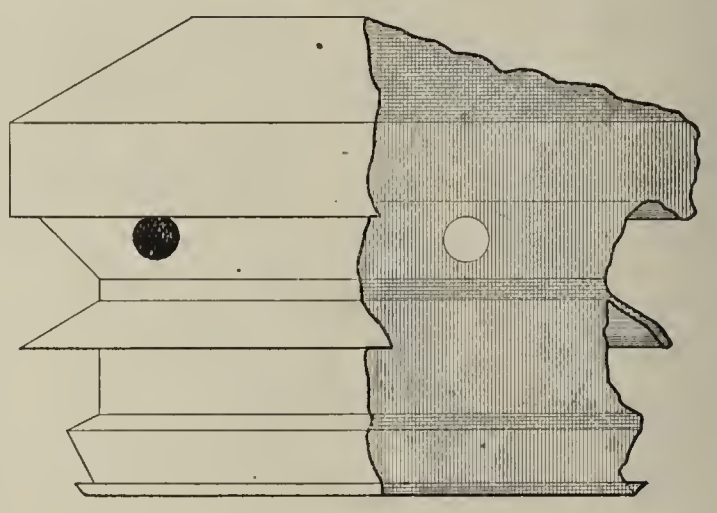


Fig. 15.

This operation is necessary to establish profile of hip bar, as will be shown later. Next extend line 6, as shown in elevation, through curb by dotted line until it strikes line 5 6 of curb at F. From F drop dotted line at right angles to A B of elevation until it cuts line 6 of plan, establishing point M in plan. We now have points S, M, N, O, P, Q, R in curb plan, of which S O P Q R is the plan of miter in curb and T V U W is plan of miter in ventilator.

It will be necessary, however, to obtain a diagonal section through hip bar before we can obtain profile of hip and the correct miter points for the pattern.

5′ 6′ equal to space between lines A B and 5 6 of elevation. At right angles to G H of plan from point M draw dotted line cutting line 5′ 6′ at M′ and cutting line A′ B′ at N′. Also draw dotted lines, as shown, from points R, Q, as shown in plan, cutting line 5′ 6′ in diagonal section at R′ Q′. From points thus obtained in diagonal section draw lines parallel to line S′ D′ until they cut the indefinite line drawn from point T in plan. Next lay off point E′ of diagonal section, making it the same distance from D′ as the space between D and E of elevation. From E′ and parallel to S′ D′ draw line cutting line S S′ at X.

We are now ready to lay out profile of hip bar. At any convenient place and at right angles to S′ D′ draw line I′ J′.

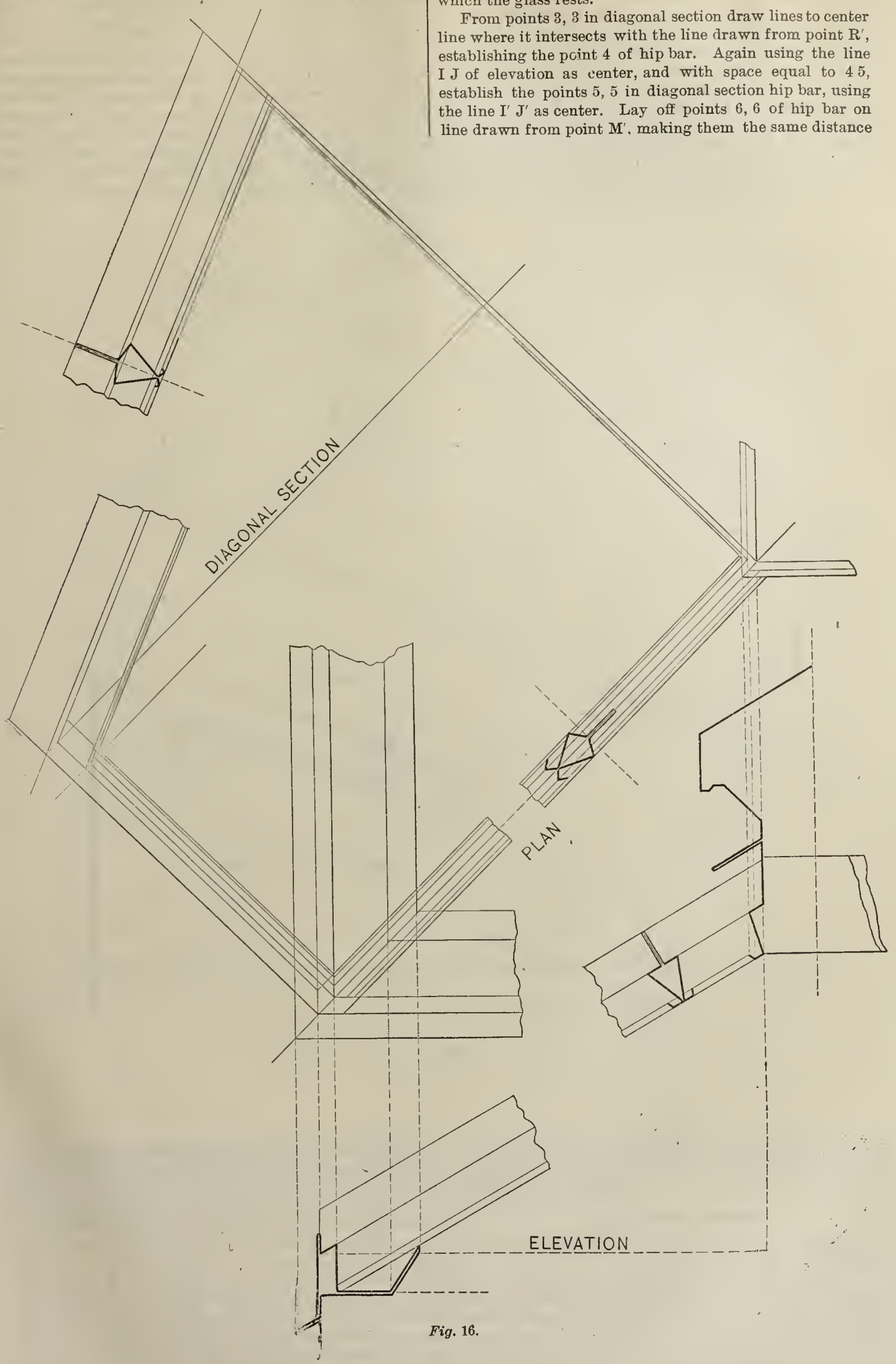


Fig. 16.

I′ J′ is therefore the center line of profile of hip bar. With space equal to 2 3 of common bar lay off the spaces 3, 3 on the line drawn from the point N′. Then a line drawn from point 2 on center line of hip bar, diagonal section, to points 3, 3 would show the profile of that portion of hip bar upon which the glass rests.

From points 3, 3 in diagonal section draw lines to center line where it intersects with the line drawn from point R′, establishing the point 4 of hip bar. Again using the line I J of elevation as center, and with space equal to 4 5, establish the points 5, 5 in diagonal section hip bar, using the line I′ J′ as center. Lay off points 6, 6 of hip bar on line drawn from point M′, making them the same distance from the line I′ J′ as 6, 6 are from the line I J of elevation. Connecting points 4, 5, 5 and 5 6, 5 6, as shown, in diagonal section we have the complete profile of the hip

bar, which may be transferred to plan, as shown. At right angles to G H of plan drop dotted line from point O until it cuts the line drawn from point N′ of diagonal section, establishing the point O′. Also, drop dotted line from point P of plan until it cuts the line drawn from point M′, diagonal section, establishing point P′.

Drop lines at right angles to G H from points V, W in ventilator plan to lines drawn from points N′, M′, diagonal section, establishing the points V′, W′.

As S, O, R, Q, P in curb plan and T, U, V, W in ventilator plan are the miter points of hip bar as they would appear in plan, and S′, O′, R′, Q′, P′ of curb and T_2, V′, T_1, U′, W′ in ventilator of diagonal section are the miter points of hip bar as they would appear in a diagonal elevation of hip, therefore the miter points of diagonal section are the correct intersections of hip bar with the curb and ventilator.

PATTERN FOR HIP BAR.

We are now ready to proceed with the laying out of the pattern for the hip bar.

In Fig. 18, extending center line I′ J′ indefinitely, as shown, at right angles to D′ S′, lay off stretchout of hip bar on I′ J′, as shown by 1, 2 2, 3 3, &c. Through these points draw lines parallel to D′ S′ indefinitely, as shown. Then lines dropped from X, S′, O′, R′, Q′, P′ and T_3, T_2, V′, T_1, U′, W′, at right angles to D′ S′, diagonal section, of Fig. 17, and as indicated by dotted lines of Fig. 18, to corresponding numbers of hip bar in the stretchout will, after tracing a line through the points so obtained in stretchout, be the necessary pattern for the hip bar. Referring to Fig. 1, we find we need four hip bars.

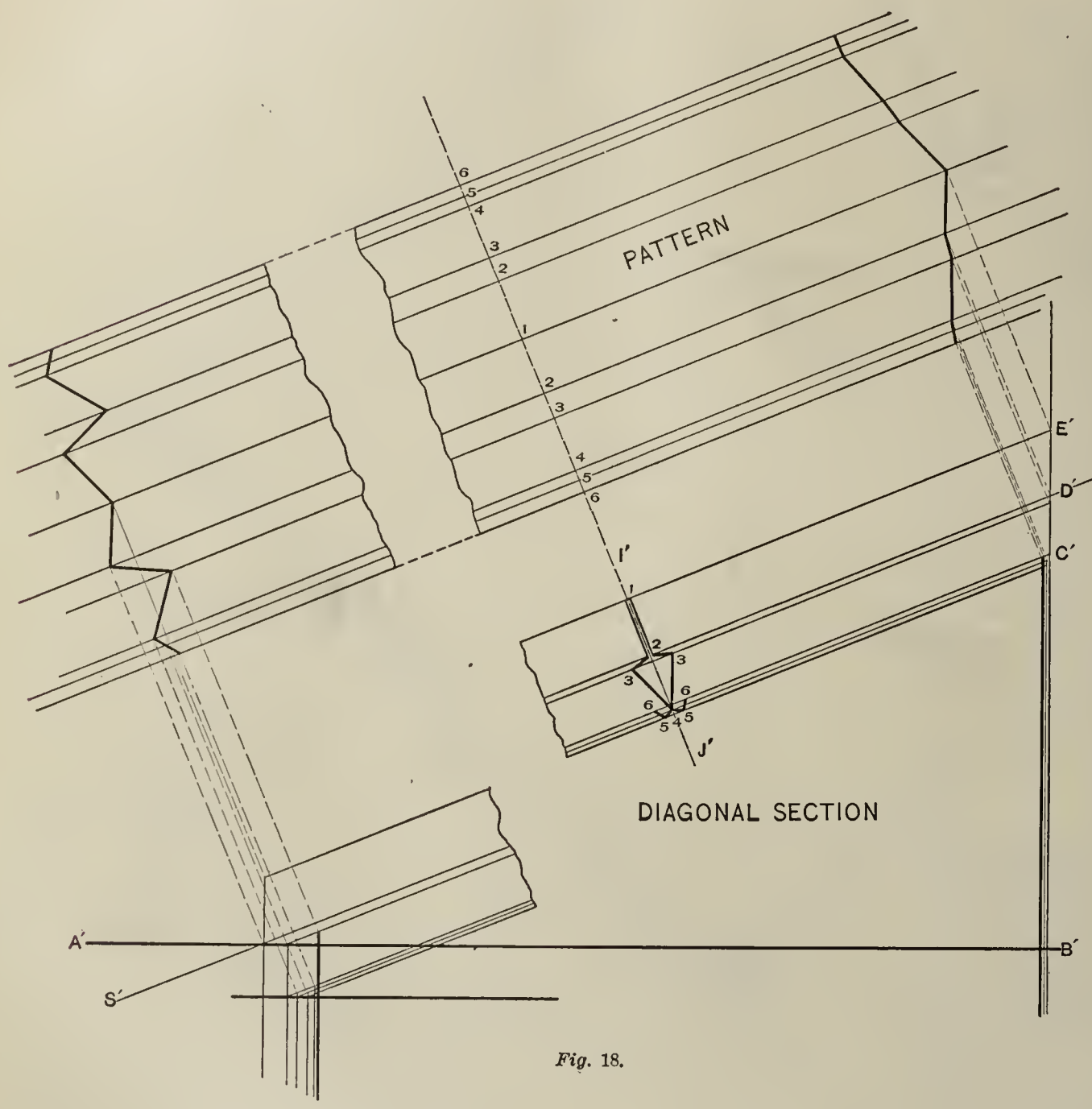


Fig. 18.

PATTERN FOR JACK BARS.

We now have all patterns necessary for the skylight except the pattern for the jack bars. Again taking elevation and plan, as shown in Fig. 19, at right angles to curb line 11 12 lay off the line B until it intersects with the center line of hip bar in plan, the distance from the miter line 11 12 of curb (or one corner of skylight) to line B in this case being the distance that M is from D in Fig. 10. Place the profile of the common bar on line B, as shown.

Parallel to line B drop lines through the various points of profile of common bar until they intersect with corresponding lines of hip bar. From the points thus obtained and at right angles to line B drop lines to corresponding lines of elevation bar—that is, line 1 of plan to intersect with line 1 of elevation, line 2 with line 2, &c., as indicated by dotted lines from plan to elevation. At right angles to elevation lay off stretchout 1, 2 2, 3 3, &c., as shown. Through these points and parallel to elevation bar draw lines indefinitely, as shown. Now from points obtained in elevation bar by lines dropped from plan and at right angles to elevation bar drop lines to corresponding lines in stretchout, as again indicated by dotted lines. Then a line traced through the points obtained in stretchout will be the desired pattern. It will be observed that the miter of the jack bar is the same

where it comes in contact with the curb as the miter of the common bars in Fig. 13. As the measuring line of the bars is on line 2, by referring to Fig. 10 (it being a quarter plan) we find we want four jack bars the length of each of the lines G I, J L, M O, and P R, 16 jack bars being required for the skylight in this case.

the right of the center line of pattern in Fig. 19 for the other side of bar.

I would suggest that laps be left on the various miters of the skylight wherever it is deemed advisable, for by so doing the maker may occasionally have an opportunity to put in a rivet and also do a much more secure job of

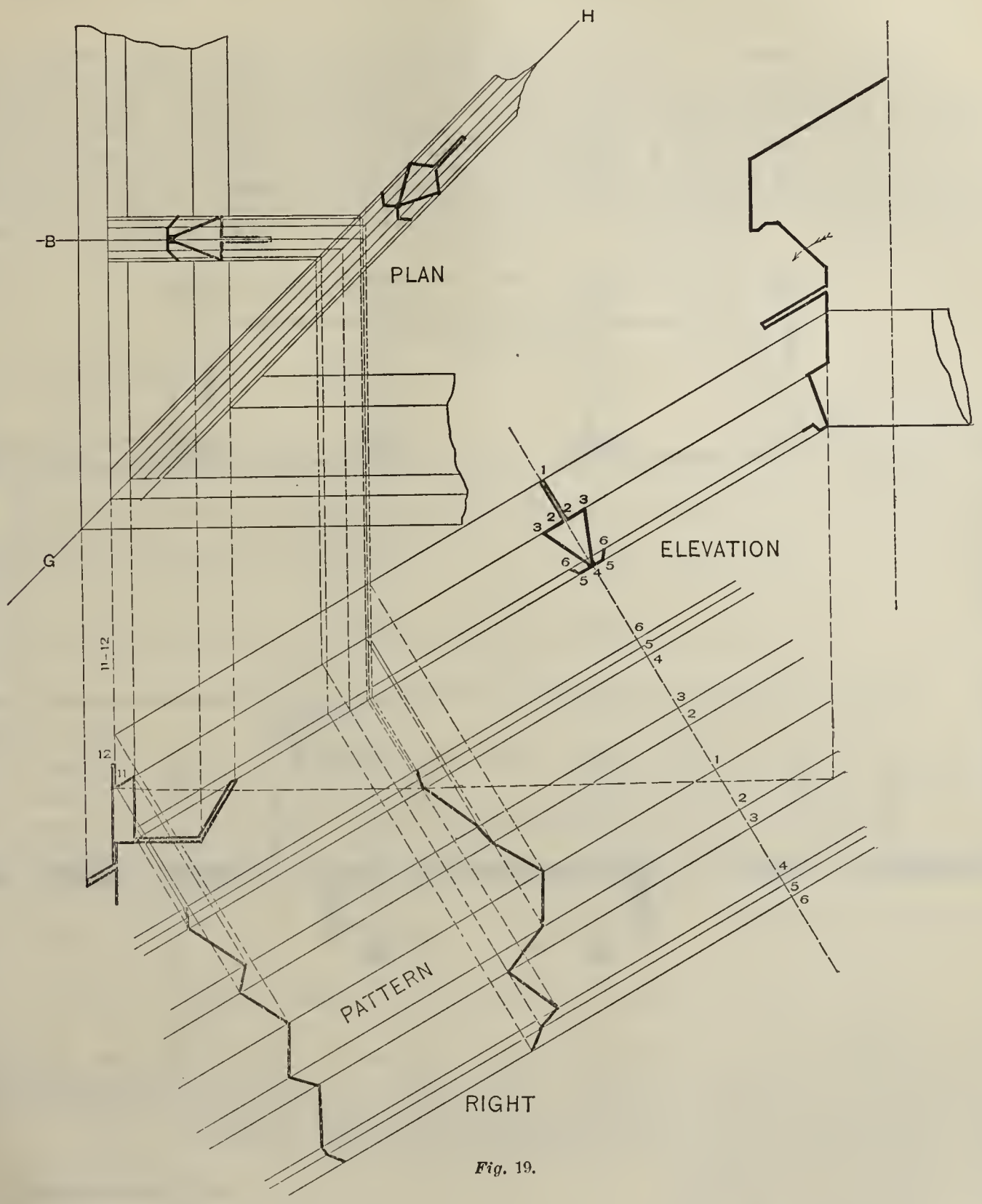


Fig. 19.

If it should so happen that a bar should intersect with the ventilator at the same point that the hip bar does, as at E, Fig. 10, one would simply have to use the half of pattern in Fig. 13 for one side of bar and the half of pattern to soldering. The bar profiles here submitted are, I think, the simplest kind in use, but it would be necessary to take the same steps as were pursued in this case to produce the patterns for any bar.

An Interesting Relic.

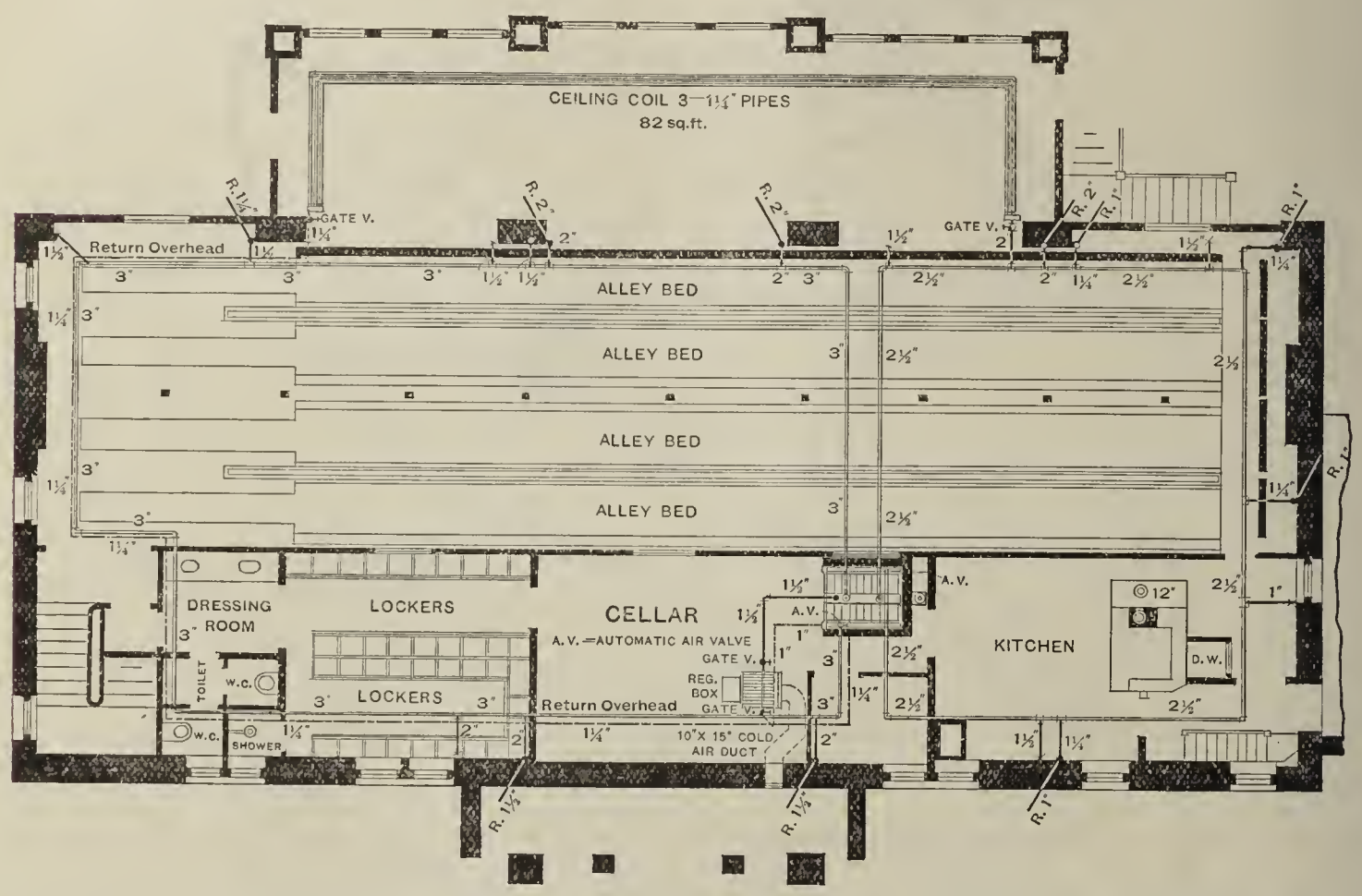
The attempt of some relic hunters to steal portions of an old boiler at Frederick, Md., has brought to light the claim of the owners and of Southern antiquarians that the boiler in question formed a part of the first boat actually propelled by steam. James Ramsey, a Maryland inventor, so runs the local statement, in 1785 conceived the idea of propelling a boat on water against the current. He devised and designed the machinery for applying steam power for this purpose, and had it forged at the old Cotoctin Furnace, near Frederick, owned and operated by Baker & Johnson. The boat was built at the Point of Rock, on the upper Potomac, and the machinery put in in the summer of 1785. The boat was worked up the Potomac to a place then called Bath, where General Washington was spending the summer. The experiment was successful, and General Washington certified that he had seen a boat actually propelled by steam at the rate of 4 or 5 miles an hour. The machinery was subsequently taken back to Cotoctin, and for two generations the boiler and the cylinder, the latter 4 inches in diameter, stood 3 feet above ground on one of the boundary marks of the Cotoctin property and Hayland, the extensive farm of William Johnson.

STEAM AND HOT WATER.

A Circuit System.

As a method of installing a steam heating plant the circuit system has grown in popularity, and as an example of such a system we show the plans, with the boiler and piping, of the club house of the Ridge Club, at Bay Ridge, Long Island. The plant was installed by W. F. Higgins & Co., 379 Lexington avenue, New York, using one of the new No. 327 Richmond sectional boilers with nine sections. The club house is situated on a slope of ground, so that the entrance to the porch and vestibule shown in Fig. 2 is from the ground level, and the floor of the basement shown in Fig. 1 is at the level of the ground at the back part. The back part of the club house faces New York Bay, and has a western exposure. The steam mains supplying the building are divided into two circuits. From the front of the boiler a 3-inch main runs to the back of the house and makes a circuit of one part of the building, and returning drops down and connects with the boiler at the right hand side at the bottom. Another main is 2½ inches in size, makes a circuit of the other part of the building, and returning connects at the bottom of the boiler on the left hand side, as shown in Fig. 1.

A third main, 1½ inches in size, runs to an indirect radiator supplied with cold air from out of doors by means of a 10 x 15 inch air duct, and located beneath a 14 x 30 radiator in the main hall on the first floor, shown in Fig. 2. The return from this radiator is 1 inch in size, and connects at the bottom of the boiler. In the basement at the back of the building is an observation space overlooking the bowling alleys. This is heated by means of a ceiling coil composed of three 1¼-inch pipes, exposing about 80 feet of surface. A separate return is run from this coil to the boiler directly beneath the steam main, following it as it makes a circuit of the building. Risers are taken from the mains to the radiators on the first and second floors, located as shown in Figs. 2 and 3. In every case the branches or risers to the radiators are taken directly from the top of the main, as shown in Fig. 4. In running the steam mains after leaving the boiler, the pipes are so graded as to have a fall throughout the entire circuit back to the boiler, to return the condensation. Automatic air valves are placed at the boiler to relieve the circuit main of air that may accumulate. The circuit main in the basement is not covered, and serves as heating surface. Where a building is adapted for the use of the circuit system a considerable saving in pipe and labor is made, and there is little danger of trapping the pipes to interfere with satisfactory results. In this case, though the building is exposed to winds from the west after sweeping across the bay, there has been no difficulty in keeping the entire building at a comfortable temperature with the system in use.



A Circuit System.—Fig. 1.—Showing Basement, with Boiler and Piping.

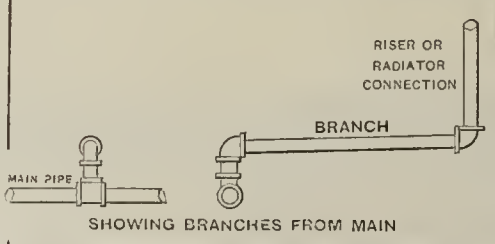


Fig. 4.—Showing Method of Connecting Branches.

HEATING NOTES.

D. F. Morgan has assumed the management of the Chicago branch of the D. F. Morgan Boiler Company, 23 and 25 West Lake street.

The monthly calendar for June distributed by M. Mahony, Troy, N.Y., is an attractive card, the central feature of which is a fishing scene. These are neat desk calendars, and will be welcomed by the trade.

The latest circulars received from the Richmond Stove Company, Norwich, Conn., are pamphlets of the Richmond steam and hot water heaters that have been issued in the interests of Davis, Wright & Co., Keene, N. H.; F. C. Weiant & Co., New Britain, Conn., and Henry Leitch, Hartford, Conn.

THE CARTON FURNACE COMPANY, Utica, N. Y., are about commencing additions to their plant to prepare for the manufacture of their line of Carton shipping room. They will also add to their foundry plant. Their first series of boilers, both steam and hot water, will be ready for the market by the middle of August, and we understand that they have already made several contracts in which these boilers will be used.

THE WILLIAMSPORT STEAM COMPANY of Williamsport, Pa., are now sending steam over all their lines except on Fourth street, from Hepburn street to Trinity Church. They cannot supply that section, as the steam pipes are under water which has not sufficiently receded.

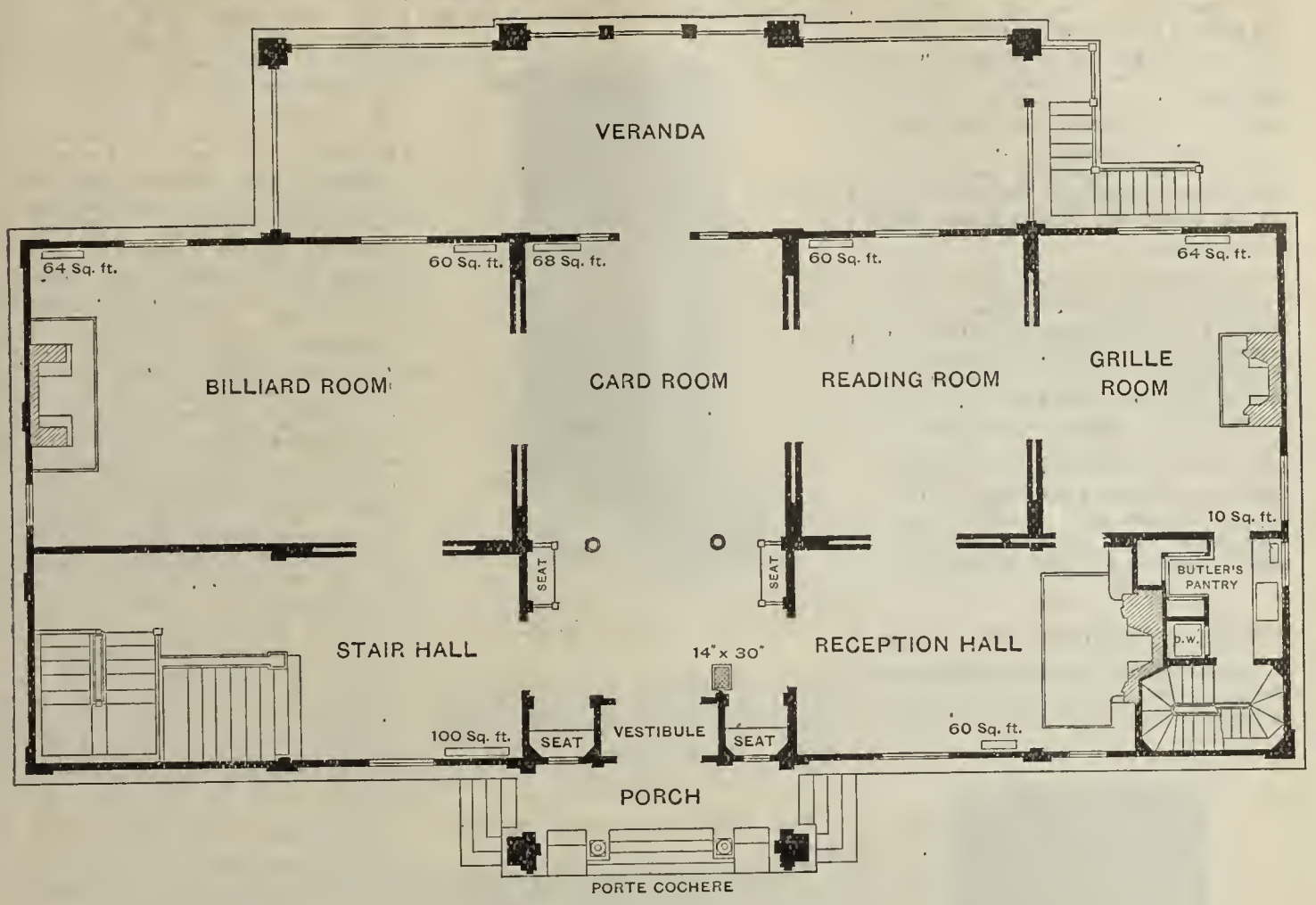


Fig. 2.—First Floor.

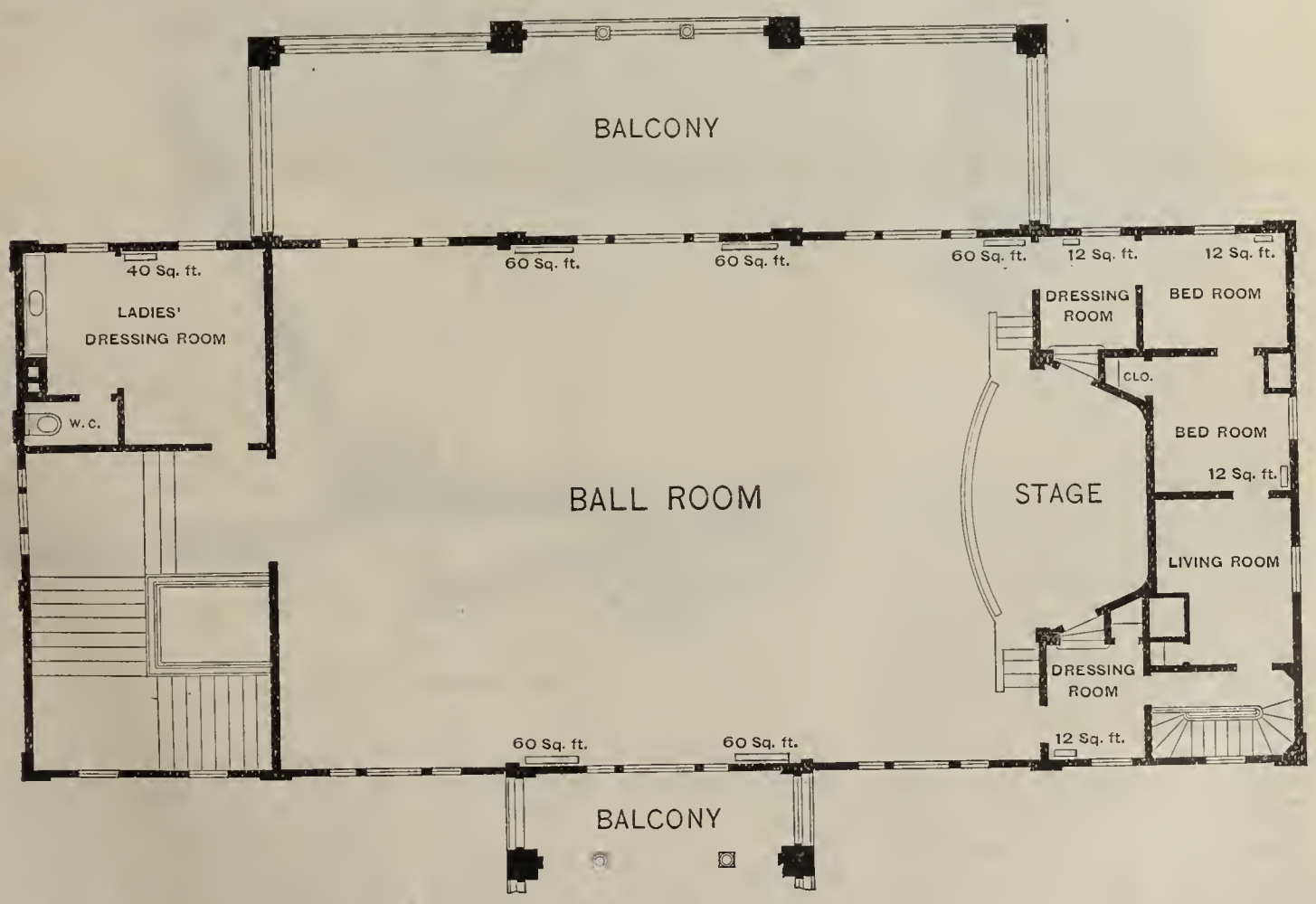


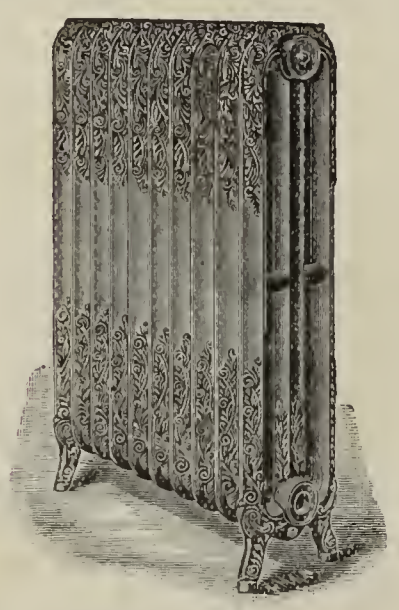
Fig. 3.—Second Floor.

THE A. A. GRIFFING IRON COMPANY are now comfortably established in their new quarters at 34 Dearborn street, Chicago. Manager Frank W. Somers has fitted up the offices and wareroom very tastefully. They are located on the ground floor, as at the previous location, but enjoy an advantage in sole occupancy. Samples are shown of a considerable number of the leading styles of Bundy radiators, handsomely painted and decorated. A portion of the space is occupied by specimens of the Gurney steam and hot water heaters, for which Mr. Somers is also Western agent.

THE AMERICAN RADIATOR COMPANY, 111 and 113 Lake street, Chicago, have issued a very fine hanger, showing no less than 46 patterns of steam and hot water radiators which they manufacture at their Detroit and Buffalo factories. They embrace a very great variety of kinds and styles, shapes and sizes. Two colors are used in printing the hanger, which is exceedingly tasteful and ornamental. It will be found very useful by steam and hot water fitters in making selections of radiators.

"New" Standard Radiators.

The accompanying illustrations show general views of two radiators lately brought out by the Standard Radiator



"New" Standard Radiators.—Fig. 1.—Regular Pattern.

Company, Buffalo, N. Y. Fig. 1 illustrates the "New" Standard radiator of regular loop. The appearance is indicated in the engraving, the radiator being a handsome article of neat and graceful form and pleasing decoration. These radiators are built in various sizes from 2 to 32 sections, and in six hights, from 18 to 44 inches high. The 32-inch loop of two sections has 9 square feet. Each section is 9 inches over all and hight from center of opening to floor is 5 inches. The manufacturers also furnish special hight leg sections, and tappings ranging from 4 to 10 inches from center of opening to floor, as required. These radiators are made for both steam and hot water.

Fig. 2 is a perspective view of the "New" Standard radiator single loop, which are made in sizes from 2 to 32 sections six hights from 18 to 44 inches, the surface of two-section radiator of 32 inches hight being 5 square feet. Each section is 5½ inches over all, and hight from center of opening to floor is 5 inches. As in the case of the regular pattern, special hight leg sections can be furnished if desired. The manufacturers particularly point out that these radiators have top and bottom connection, which they say insures rapid and

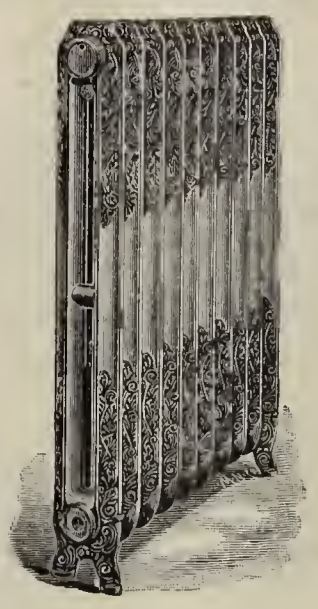
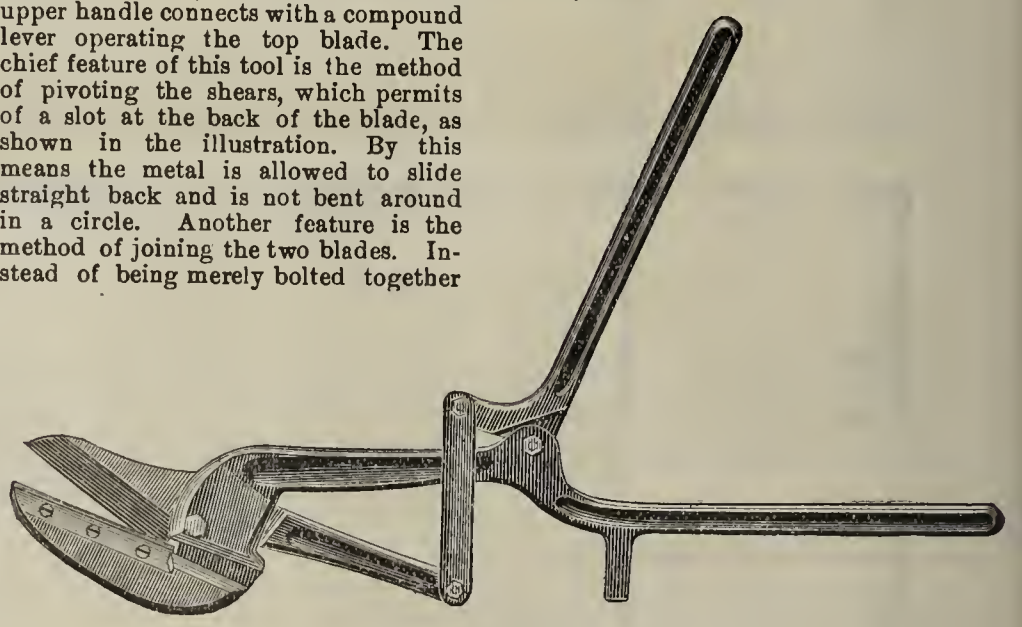


Fig. 2.—Single Loop.

positive circulation. They mention that they have decided to make all their radiators in this way, as they are firmly convinced of its superiority.

The Lobl Sheet Metal Shears.

We show in the accompanying illustration a general view of the Lobl sheet metal shears, manufactured by Eugene Kulinski & Co., 91–93 Thompson street, New York. Referring to the illustration, it will be seen that the lower shear is a single piece, to which is attached the shear blade, as illustrated. The upper handle connects with a compound lever operating the top blade. The chief feature of this tool is the method of pivoting the shears, which permits of a slot at the back of the blade, as shown in the illustration. By this means the metal is allowed to slide straight back and is not bent around in a circle. Another feature is the method of joining the two blades. Instead of being merely bolted together



The Lobl Sheet Metal Shears.

the main joint runs in a turned socket, which, it is pointed out, takes the strain off the screw. The compound lever, of course, gives great power to the shears. The shears are made of cast steel, the jaws being of hardened Carpenter & Jessop steel, and it is mentioned are easily replaced. The upper jaw is rounded so as to reduce the cutting point to a minimum. The No. 3 shears are 36 inches long with 6½-inch jaws, weigh 20 pounds, and will cut metal as heavy as No. 10 brass and No. 12 iron.

Australian Tin.

Australia, as is well known, is one of the tin bearing countries, from which supplies of the metal find their way to the United States. The principal stanniferous deposits of that country are found in the colony of New South Wales, where they were discovered as far back as 1853. It was not, however, until 1872 that they began to be systematically worked. From recent statistics of the mineral production of New South Wales, furnished by the Colonial Department of Mines, the quantity of tin raised and exported during the 21 years ending December 31, 1892, was 121,912 tons, valued at $31,236,368. This includes tin in the shape both of ore and of ingots. The *Iron and Steel Trades Journal* of London observes that the production of the metal is now one of the settled industries of the country, and, as the supply is practically unlimited, the quantity raised depends almost entirely upon the price realized. There are no tin manufacturers in New South Wales, and although the mineral is so plentiful in the colony, the whole of the manufactured tin used for canning meat and fruit and other purposes has to be imported. The quantity of tin plates so imported during 1892 amounted to 62,078 packages, of the estimated value of $237,875. There were also 19,033 packages of tinware, valued at $80,613. Practically the supply of tin in the colony is inexhaustible. Up to the present time the deep deposits and lodes have scarcely been touched, the bulk of the metal obtained being in the form of stream tin.

The latest addition to the American Line's transatlantic fleet is the "Kensington," which made a most successful trial trip on the Clyde last week. The vessel was built by J. & G. Thompson of Clydebank, Scotland, the builders of the "New York" and "Paris." She is 480 feet long, 57 feet beam and 40 feet deep, with gross tonnage of 10,500 tons, and a measured cargo capacity of 11,500 tons. The "Kensington" is fitted with quadruple expansion engines of 8000 horse-power, and is expected to attain a working speed of 15 knots per hour. While primarily a cargo and steerage steamship she will have accommodations for 200 cabin passengers.

PLUMBING and GAS FITTING.

William C. Macdonald.

The plumbing trade will learn with regret of the death of William C. Macdonald, who was drowned in the Passaic River, near Nutley, N. J., while heroically endeavoring to save the life of a young lady who had fallen from his naphtha launch, "The Martha," last Saturday afternoon. Mr. Macdonald was a member of the plumbing firm of Macdonald & Co., 296 Sixth avenue, New York, being associated with Alexander Bryant and W. J. Crow. Mr. Macdonald is a son of the late Joseph A. Macdonald, who organized the firm in 1861, and who was well known to the plumbing trade, having been identified with the great progress which it has made during the past ten years, serving as president of the New York Association of Master Plumbers as well as president of the National Association of Master Plumbers. The young man was 22 years of age, and his death was a severe blow to his mother and two brothers, who live at the Chelsea apartment house in New York.

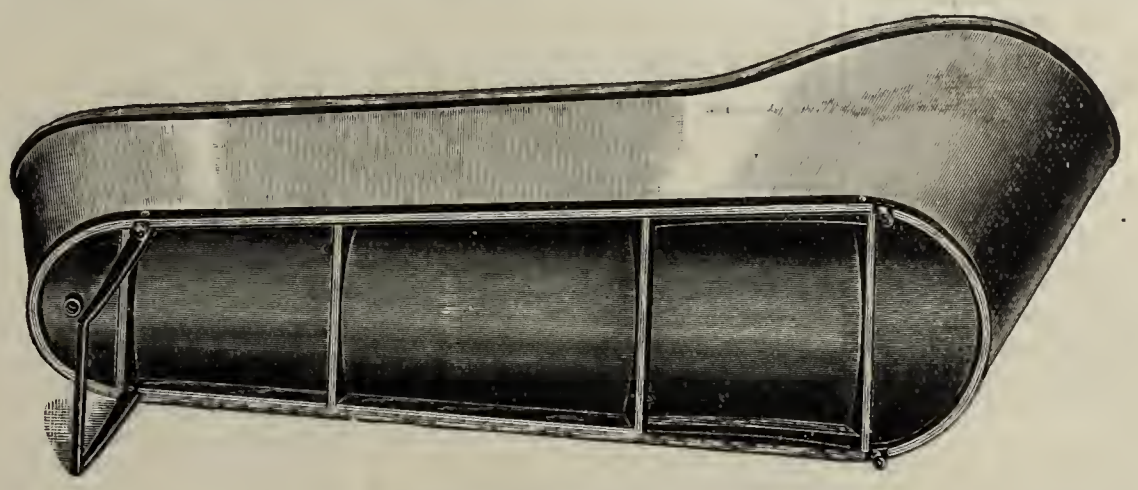
A Worthy Plumber.

The following letter to a Bridgeport, Conn., daily paper from Daniel G. Finnerty, president of the National Association of Master Plumbers, expresses the opinion held by all of Mr. Goodsell's friends:

I notice in your issue of May 21 the New York *Tribune* sneers at the proposition of elevating a common plumber to the high station of Governor of your State. I should like very much for the New York *Tribune* to send one of its representatives to one of the Master Plumbers' State or National conventions that he might see and learn that the plumbers of the United States compare favorably with any class of business men, both in ability and integrity, for the welfare of the citizens and public at large. There can be found men among the plumbers who are competent and capable, not only to fulfill the high position of Governor, but also any office in the gift of the people, and Zalmon Goodsell is one of those men, and whom I have had the pleasure of knowing for a number of years, and the citizens of Connecticut would be the gainers by electing a thorough business man to the very important position of Governor. Therefore let your citizens nominate and elect Zalmon Goodsell Governor of your State and the citizens will have a man who will administer its affairs with both intelligence and honesty and in a business-like manner, and that is what is wanted by all good citizens. Hundreds of business friends of Mr. Goodsell throughout the country know full well that if elected Governor the people of Connecticut will never regret that they cast their votes for the Bridgeport master plumber.

Economy Bathing Tub.

The accompanying illustration shows a general view of the Economy bathing tub, manufactured by Forest Drukenbrod, New Berlin, Ohio. It is a portable bathtub, made of zinc, with top and bottom rims of well seasoned bent hardwood. The advantages of this form of bathtub are alluded to by the manufacturer. The tub can be transported wherever it is desired to have it, and when not in use can be hung against the wall or placed in a vacant corner or closet. It has plug and chain attachment, the waste being at the lower end, as shown in the illustration. The bottom is concave or rounding, so that it does away with the necessity of much water and at the same time fits the body. The tub can be elevated at the foot end so as to raise the level of the water and completely cover the body. It is painted on the outside and enameled within.



Economy Bathing Tub.

A NOVEL METHOD of bringing an apparatus that is very essential in high buildings in the large cities to the notice of the public is adopted by the National Meter Company, 287 Broadway, New York. An attractively painted open wagon bearing their name and address, with the words, "Water Meters and Gas Engines," is being driven around the city, stopping occasionally at different points on the streets, which shows a Nash pump operated by a gas engine adapted for the use of gasoline. The pump is connected with a tank about 3½ feet in diameter and the same hight, and in operation a steady stream of water is continually thrown into the tank by the pump. The tank bears the lettering: "Capacity, 750 gallons per hour to a hight of 50 feet."

Trade School Exhibits at the Pratt Institute.

The annual exhibition of the work of the students during the academical year 1893–94 was held at the Pratt Institute, Brooklyn, on May 31 and June 1 and 2. Among the most interesting exhibits were those of the Trade School classes of the institute, which included plumbing, carpentry, house, sign and fresco painting and machine work. Each department made a remarkably creditable showing, and none more so than the plumbing class. The work of the pupils of the class—about 50 in number—was displayed in their own class room. Specimens of the handiwork of each student being attached to the wall opposite his particular bench. On one side of a large show board in the center of the room was a complete system of piping for a kitchen boiler connection and lavatory. The other side displayed a fine collection of fancy plumbing work, all being the work of the pupils. In addition, two handsome panel specimens, the work of the 1892–93 class, were on exhibition. These panels formed part of the Pratt Institute educational exhibit at the World's Fair.

The examples of the skill and efficiency of the pupils of the plumbing class drew for the same hearty words of commendation from the visiting plumbers who viewed them. They reflect great credit on Instructors Todd and Heath, under whose management and care the necessary knowledge has been imparted. A marked feature of the present year's exhibition was the lively interest shown in it by the various trade associations. Large delegations of artisans attended and carefully inspected the work on view.

Already many applications have been received from young tradesmen desirous of joining next season's plumbing class, and it is expected that, as usual, the candidates for instruction will far exceed the accommodation. The managers of the Trade School take a pardonable pride in the unqualified success of the institution, which is progressing annually to greater importance and usefulness.

Missouri Master Plumbers.

The following was sent by State President L. B. Cross, 1212 Main street, Kansas City, Mo., under date of June 1 to the plumbers of Missouri:

The Missouri State Association of Master Plumbers will meet in St. Louis on Friday, June 15, at 10.30 a.m., at the hall of the St. Louis Master Plumbers' Association, Hagan Building, S. E. corner Tenth and Pine streets. The object of the meeting is the election of delegates to the National Convention in Detroit, on June 19, and for the transaction of such other business as may come before the meeting. We congratulate our brother plumbers on the good spirit and unanimity shown since the organization of the State Association in Kansas City last December, and we hope to see every city and town in our State represented at this meeting. Delegates on arriving will please immediately report themselves at the headquarters, Lindell Hotel, Sixth street and Washington avenue, where the Reception Committee will be in continual session o tender them a cordial and hearty welcome.

TRAPS AND VENTS.

A. S. CHIPMAN of the firm of A. S. Chipman & Co., manufacturers' agents and dealers in plumbers' supplies at 69 Pearl street, Boston, was married to Miss Nellie Jubell of Winooski, Vt., on Wednesday evening, May 31. After a tour the couple will settle down in Wellington, Mass.

JOHN SHINE, plumber, has moved his material from Elm street to the building in the rear of the Trenton National Bank, Trenton, Mo.

G. A. STANFIELD, who for the past two and one-half years has been in the employ of the Marietta Plumbing Company, Marietta, Ohio, has established himself in the plumbing and gas fitting business at 411 Second street.

GEORGE M. O'CONNOR, 156 Fulton avenue, Long Island City, N. Y., has just started in the plumbing business.

ROBERT HANDYSIDE has purchased the plumbing business formerly conducted by A. Handyside at 120 Worthington street, Springfield, Mass.

T. C. WATERS, who has been in the plumbing business at Shenandoah, Pa., for the last 22 years, has opened a store at Pleasantville, Pa., or Eureka post office, as it is called, where he will carry on plumbing, tinsmithing and also carry a full line of stoves, heaters, &c.

ISAAC H. VOORHIS has succeeded his brother, the late Garret D. Voorhis, in the stove and plumbing business, at 11 Fair street, Paterson, N. J.

A WASHINGTON (D. C.) PLUMBER has been brought before a justice for violating the plumbing regulations, having pursued his occupation without a license.

W. E. EVERITT, 336 Hamburg street, Buffalo, N. Y., is using in the city of Buffalo a machine for boring holes through the earth under street pavements for tapping water and gas mains without disturbing the pavement. The local plumbers, it is reported, have witnessed its operation and are pleased with the result.

SOME OF THE PLUMBERS OF OMAHA, NEB., were recently brought before the Board of Public Works and admonished that if they did not cease to transgress the rules of the Board their licenses would be revoked. Some of the plumbers in the city have chosen to run the risk of doing business without a license, and when their work required a permit this portion of it was sublet to a licensed plumber. The board has decided that such practice is illegal and has served notice that the next time a licensed plumber is found doing such work his license would be revoked.

THE CITY COUNCIL OF PUEBLO, COL., have revised one of the clauses of their plumbing ordinances as follows: "No person shall carry on or contract the business of plumbing or drain laying or engage in the business of plumbing or house drainage or connect house drains with city sewerage until he or they shall have first obtained a license from the city clerk; provided, no license shall be granted any applicant or applicants until he or they shall first have given the plumbing inspector, city engineer or Sewer Committee satisfactory oral or documentary evidence of their ability as a practical plumber or plumbers or drain layers, and they shall have a regularly established plumbing business and place of business in the city. They shall have a properly executed bond in the sum of $1000, and pay an annual license fee of $10."

THE DAVIS CRESWELL MFG. COMPANY of Denver, Col., met with a serious loss on the 28th ult. in the almost complete destruction by fire of their foundry and machine shop, used in the manufacture of plumbers' and steam fitters' supplies.

H. E. MCKECHNEY, formerly of Rochester, N. Y., has opened a plumbing shop in the Waverly Block, Newark, N. Y., as his headquarters for plumbing, steam and hot water heating.

THE SMITH & ANTHONY COMPANY of Boston, New York and Chicago have issued a circular announcing that on June 1, 1894, they transferred the plumbing specialty business carried on in their name at 217 Lake street, Chicago, to the Alberene Stone Company, who will act as Western agents for the Sanitas plumbing appliances. They state that the wide acquaintance and popularity of the Alberene Stone Company are guarantees that their patrons will receive prompt and satisfactory service in all future dealings. J. A. Cunningham, Jr., who has been their Western manager for the past four years, becomes associated with the Alberene Stone Company in a responsible capacity, and with the added facilities at his disposal will be able to represent the Sanitas specialties more acceptably to the trade than ever before. The Alberene Stone Company notify the trade that, having assumed the agency in Chicago for the sale of the plumbing specialties manufactured by the Sanitas Mfg. Company, they have removed their office and warerooms to 217 Lake street, where they will continue to sell their Alberene stone specialties in connection with the Sanitas appliances. C. C. Todd retains the management.

THE MONTHLY REPORT of the Building Inspector of Cincinnati, Ohio, will show that during the last month 163 plumbing permits were issued. This is the largest number in the history of the office for that period.

JAMES GRAY, plumber and manufacturer of plumbers' specialties, East Albany, N. Y., took a steamer this week for a trip abroad. He will visit England, Ireland and Scotland and will make a short trip on the Continent.

The Chicago Plumbers' Arrangements.

The Chicago Master Plumbers are arranging for a pleasant excursion to Detroit on the occasion of the approaching national convention. They have issued the following circular:

CHICAGO, ILL., June 5, 1894.

To Delegates and Members of the Master Plumbers' Association who will attend the Twelfth Annual National Convention, to be held at Detroit, Mich., June 19–21, 1894:

The Chicago Master Plumbers' delegates, alternates and members have arranged their transportation to Detroit and return via the Wabash Railroad. A special train has been chartered and will leave Chicago at 10 a m., June 18, from depot, Dearborn station, and arrive at Detroit not later than 5 30 p.m. Train will consist of the following first-class vestibuled equipment: Baggage car. with commissary, ladies' coach and Wagner palace sleeping cars and private dining car, which will be stocked with the choicest delicacies of the season. The cost of the railroad ticket in the Central Traffic Association will be one and one-third fare for the round trip—namely, when purchasing your ticket request certificate of railroad agents, which certificate, when signed by the secretary of the Master Plumbers' National Association, at Detroit, will entitle you to return to starting point in the Central Traffic Association at one-third the regular one way rate. The fare from Chicago to Detroit, one way, is $7.75.

The round trip on this plan will be $10.35. Dinner in dining car will be only $1. The committee have chartered the very best Wagner sleeping cars in special service, direct from the Wagner Sleeping Car Company. Seats in the sleepers can be had on the train at a minimum of expense. The Committee of Arrangements have carefully considered the question of comfort and economy, and trust their efforts, which have been directed toward the immediate benefit of the members, will be appreciated.

An invitation is hereby extended to all delegates, alternates, members and their families, who can arrange conveniently to come via Chicago, to join our special train party. The trip will be a delightful one. Up to the present time the Western Passenger Association have failed to give reduced rates in their territory. We are hopeful, however, of securing some reduction for any who may apply to us, from points tributary to Chicago. The committee would like to hear from all who have in contemplation the trip to Detroit, so that ample accommodations can be provided and unnecessary crowding of special train be avoided. Tickets and certificates can be had on application to undersigned,

or ticket offices of Wabash Railroad, 201 Clark street, Chicago, at depot office and also on the special train.

PAUL REDIESKE, President.
ALEX. M. MURRAY, Secretary.

J. G. ROLAND, Ch., P. M. MURPHY, T. P. CULLOTON, P. SANDERS, } Transportation Committee.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

HUNT & CONNELL COMPANY, Scranton, Pa., have contract for placing a No. 310 Low Down steam and air combination in the residence of Geo. Hughes of Luzerne, Pa. The same firm also have contract for placing a No. 218 Economy steam boiler in the building owned by James Hughes of Luzerne, Pa.

DAVID HORN, of York, Pa., has contract for installing one Economy combination steam and air heater in the residence of David Strickler of that town.

THE CONTRACT for the heating apparatus for the new Industrial School at Newport, R. I., has been awarded to Philip F. Conroy.

AT THE LAST MEETING of the Executive Committee of the Board of Trustees of the Winthrop Normal and Industrial College, Rock Hill, S. C., the following contracts were given out: For heating apparatus to main building and one dormitory, to Hunnicutt & Bellingrath, Atlanta, Ga., plant to cost $10,000; for slate roof for main building, one dormitory, kitchen and heating plant, to Jones & Co., Atlanta, Ga., price $6300.

THE S. WILKS MFG. COMPANY, 113 to 123 Clinton street, Chicago, are to furnish a large heater for the residence of Mr. Cleveland, Englewood; a large heater and tank for the apartment building of H. Konoke, Dunning and Sheffield streets; Wilks heater and radiator for heating and supplying hot water for the depot of Swift & Co., Port Huron, Mich.; heater for greenhouse at Stillwell, Mich. The company have also received orders for their heaters from Macon, Mo., Romeo, Mich., and other points.

EVERY ONE RECOGNIZES the supreme importance of first-class plumbing, says a writer in one of the Boston dailies, speaking of their recently completed $3,000,000 court house. The plumbing work in this building was installed bp George A. Wilson of 73 Essex street. The fixtures include 215 water closets, 75 lavatories and 60 urinals. The latest and most improved materials were used throughout in fitting it up. The hot and cold water pipes are of extra heavy brass. This plumbing contract was one of the largest ever given in New England. The heating of the building was designed by Bartlett, Hayward & Co., Baltimore, and the contract, which amounted to $125,000, was awarded to Samuel I. Pope & Co. of Chicago. The work of installation was supervised by J. E. Lynch, now of the firm of Lynch & Woodward, of 26 Beech street, Boston.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until June 29, for work including the plumbing for the United States Post Office, Custom House, &c., Building at Jacksonville, Fla.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until June 30, for a low pressure return steam heating and ventilating apparatus for the United States Court House and Post Office Building at Tallahassee, Fla.

THE BOARD OF SUPERVISORS of Schuyler County, N. Y., met at Watkins last Saturday to award the contracts for the repairs to the county buildings. The contract for the steam heating and plumbing was awarded to R. H. Walker of Elmira, N. Y., for $2857.

HIGGINS & Co, 379 Lexington avenue, New York, have the contract for heating a four-story stone dwelling at 310 West Eighty-ninth street, using a No. 124 Richmond hot water heater; also a hotel, 270 Bowery, owned by Gary & Lowless, using a No. 313 Richmond hot water heater.

JAMES A. TRANE, La Crosse, Wis., has been awarded the contract for furnishing the heating apparatus for the new addition to the Logan Street School.

THE SCHOOL BOARD OF INDIANAPOLIS, IND., have passed an appropriation of $1800 for the repairs to the heating boilers and construction of new flues in School No. 2.

AMONG THE CONTRACTS taken recently for steam heating by Cook & Chick, 253 and 255 Kinzie street, Chicago, can be mentioned the following: Store and apartment building of Hynes Bros., 3641 and 3643 State street, and the store and apartment building of Lewis Bates, 3637 and 3639 same street.

MRS. A. J. NYE is having placed in her frame dwelling a No. 418 Richmond steam heater, by C. B. Jackman & Son, Nashua, N. H., who are also installing Richmond hot water heaters in the residences of George B. and D. J. Cone.

THE THEO. JACOBS COMPANY, 72 and 74 Market street, Chicago, have secured the contract for steam heating in the Marquette Building, Dearborn and Adams streets. There will be 50,000 feet of the American Radiator Company's radiators used in the building.

KEHM & MERTZ, 289 East Kinzie street, Chicago, are to install a steam heating plant in the residence of C. E. Kohle, 2826 Michigan avenue.

THE WELLS & NEWTON COMPANY, 274 Dearborn street, Chicago, are to install a steam heating plant in the Wellington Apartment Building, Thirty-fifth street and Wabash avenue.

THE KELLY & JONES COMPANY, 48 to 52 North Clinton street, Chicago, have the contract for steam heating in the Winston Apartment Building, East Superior street.

MARVIN & DEBOOY of Orange City, Iowa, are using a No. 121 Richmond hot water heater to heat the dwelling owned by Charles Lewis of that city.

THE WALCOTT-HURLBUT COMPANY, 175 and 177 Lake street, Chicago are to furnish two Siphon Eduction closet ranges of seven sections each for the Crain Street School at Evanston, Ill.

THE WELLS & NEWTON COMPANY, 274 Dearborn street, Chicago, have the contracts for plumbing in the Marquette Building, Adams and Dearborn streets; residence of C. E. Johnston, 4442 Forestville avenue, and are to overhaul the plumbing in the residence of C. E. Kohle, 2826 Michigan avenue.

RICHMOND STEAM AND HOT WATER HEATERS are being used in heating contracts secured by J. H. Cogan & Co., Augusta, Maine, for the residence of the Hon. Benj. F. Parrot. At Boston Isaac Coffin & Co. are using them in the residences of C. A. Pierce, C. W. Mason and N. E. Chase. At Lowell, Mass., the H. R. Barker Mfg. Company are using one in the residence of Willard A. Brown, and F. A. Bates has the contract to use one in the Lyceum Building, at Braintree, Mass.

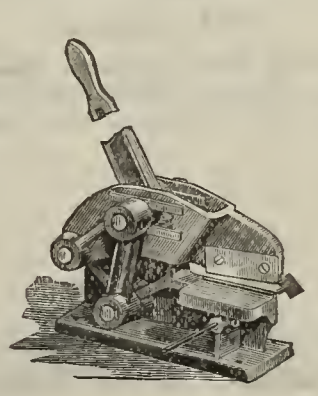
BIDS will be received up to June 24 for furnishing hot air furnace to heat the school building at Milford, Ohio. The bids should be addressed to Dr. Con. Gatch and should be inclosed in an envelope marked "Bids for furnace."

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until July 6, for steam heating and ventilating apparatus for the United States Post Office Building, Fort Dodge, Iowa Drawings and specifications may be obtained at the office of the superintendent at Fort Dodge, or from the Supervising Architect at Washington.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until July 3, for the hot water heating and ventilating apparatus for the United States Post Office Building, Lowell, Mass. Drawings and specifications may be obtained at the office of the superintendent at Lowell or from the Supervising Architect at Washington.

Core Rod Cutter and Shear.

The engraving represents a tool designed by the S. Obermayer Company of Cincinnati, Ohio, for the foundry core room or where a miscellaneous amount of cutting off and light shearing is done. It will cut round iron up to ⅝ inch in diameter, and with the gauge attached, which can be set to any



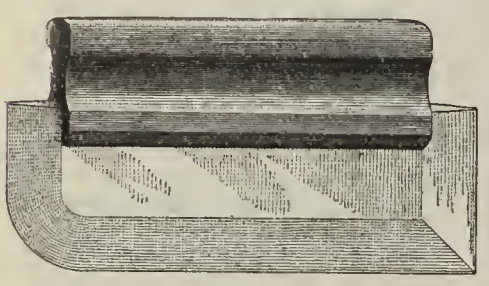
Core Rod Cutter and Shear.

length up to 15 inches, rapid work is possible. The shears are of tool steel 4 inches in length and can be readily removed for sharpening. The handle is of malleable iron 15 inches long. By reference to the engraving it will be seen that the rear ends of the two jaws are pivoted together, the upper jaw being slotted to admit the other. The two jaws are also connected by links whose lower ends are pivoted to the lower jaw and whose upper ends are provided with studs entering guides formed in the upper jaw, as shown. This arrangement gives great lever power and permits of the cutting of large pieces, considering the size of the machine, which weighs but 35 pounds.

THE RETAIL STORE.

The Boosinger Scraper.

Harris E. Thomas, Lansing, Mich., is offering the scraper herewith shown. It consists of a heavy piece of rubber 4½ inches long and 1¼ inches wide, with beveled edges, set in a wooden handle. The device is particularly adapted to scraping off dining room dishes of all shapes. The point is made that with the scraper this is done much quicker and neater



The Boosinger Scraper.

than with a knife, and that all danger of marring or scratching the finest of china or silver is obviated. It is explained that the rubber blade being thick, with beveled edges, it will not roll under, but clings to the dish, and so effectually cleans even one of irregular surface that little more than a thorough rinsing in water is required to make it perfectly clean. The scraper may be used for drying windows or other smooth surfaces; also for cleaning fry pans, kettles, pudding dishes, basins, &c., preparatory to washing them.

Ladder Skate.

Specialty Mfg. Company, Titusville, Pa., are offering a ladder skate, as here shown. The bottom of the skate is

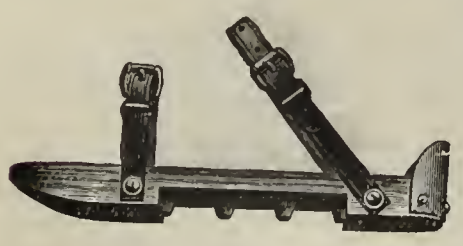


Fig. 1.—Ladder Skate.

provided with a three-loop casting to prevent slipping on the round of a ladder. The manufacturers state that the skates can be put on or taken off in an instant; that they do not have to be



Fig. 2.—Bottom of Ladder Skate.

taken off when walking on the ground; that by their use standing on the round of a ladder is made as comfortable as standing on the ground, and that the skates are so made that the foot can be moved on a ladder to any desired position. The skates are designed for the use of tinners, painters, fruit growers and others who use ladders. The point is made that the skates are great savers of shoes.

Double Tank Thermometer Churn.

R. M. Ball, Muncie, Ind., is offering the double tank churn shown in the accompanying illustrations. The churn consists of a vertical dasher with a rotary reciprocating motion and two detachable cylindrical tanks, one of



Fig. 1.—Double Tank Thermometer Churn.

heavy cross tin inserted inside of and resting with its upper rim or flange upon the wooden tank, the inner one of which forms the cream containing vessel, as shown in Fig. 2. The space between the tanks is filled with water, allowing the operator to control the temperature of the cream by pouring either hot or cold water into the tube

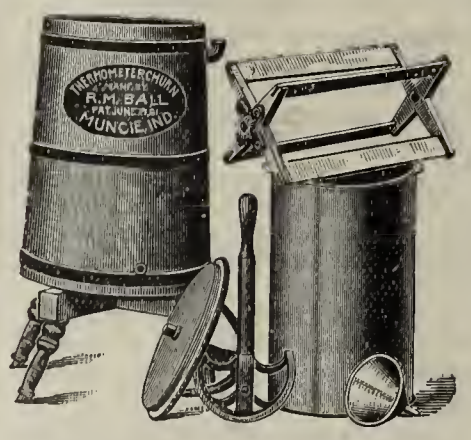


Fig. 2.—Parts of Double Tank Churn.

near the top of the outer tank by the aid of the funnel. Thus the temperature of the cream can be changed in a moment without adulterating it with water. The churn has an indicator in the cover to enable the operator to tell when butter comes, and also to give perfect ventilation. The manufacturer claims that with the churn butter can be made out of any cream, sweet or sour, in from 2 to 20 minutes; that the churn is easily taken apart and cleaned; that there is nothing about it to wear out or to get out of repair: that 1 quart of cream can be churned as well as 4 gallons, and that there is no slopping or dripping of the cream.

The Peerless No. 2 Telephone Outfit.

Robert H. Ingersoll & Brothers, 65 Cortlandt street, New York, are offer-

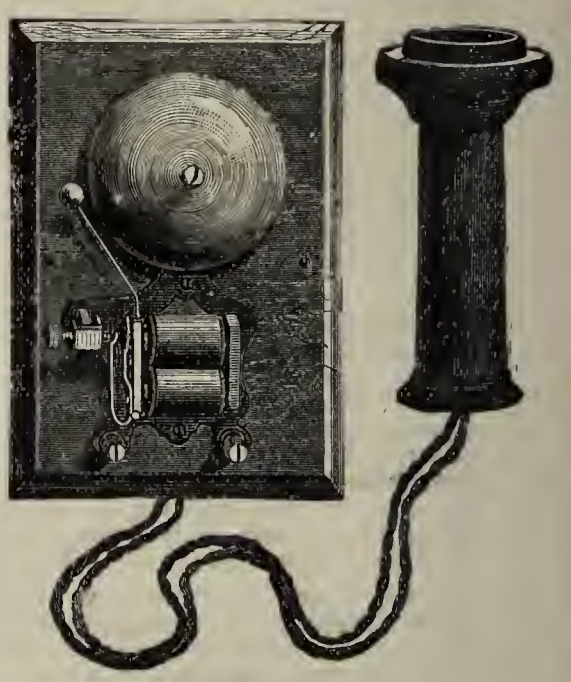


Fig. 1.—Call Bell and Receiver-Transmitter.

ing the telephone outfit as here shown The parts illustrated in Fig. 1, and the battery in Fig. 3, are furnished in dupli-

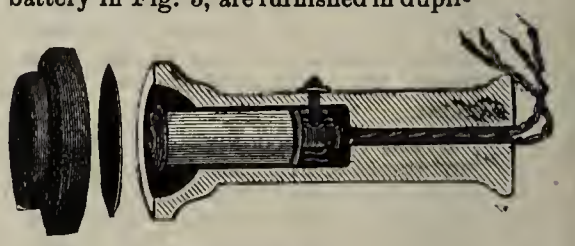


Fig. 2.—Receiver-Transmitter in Detail.

cate, providing a call bell, receiver-transmitter, and battery at each end of the line. The receiver transmitter,

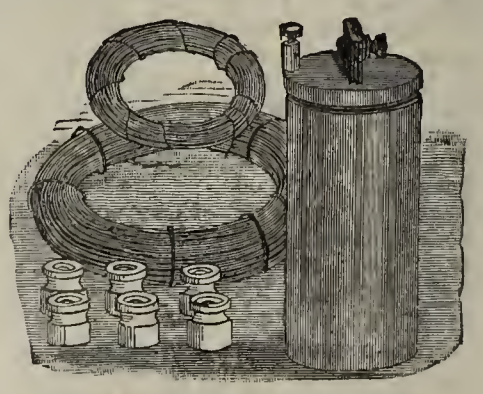


Fig. 3.—Battery and Accessories.

Fig. 2, is a combined instrument which is alternately placed to the mouth to deliver the message, and then to the ear

to receive the answer. It is stated that this will carry sound with the same distinctness on all lines of any length. The call bell, Fig. 1, ordinarily furnished with the outfit is constructed to ring for a distance of 1 mile and under. Bells of greater capability are furnished with outfits for long distances. The bell is mounted on a polished hardwood backboard, from which the receiver-transmitter is suspended by a telephone cord. At the back of the board, concealed from view, are the switches and connections, which are automatically operated by two push buttons at the side of the board, one to ring up and the other to connect the phone with the line wire and battery. The outfit here represented is sold at $7.50, and is guaranteed by the makers to work perfectly over 1500 feet of No. 18 copper or No. 10 iron wire. By adding a battery to each end—making two batteries at each end of the line—the outfit will work to half a mile, and by the addition of another battery to each end it is made to work up to 1 mile. If proper calculation is made in ordering, enough wire, &c., may be shipped to cover all requirements. The manufacturers suggest that where distance will add largely to the cost of shipping the batteries be bought near at hand, if good batteries can be so secured.

Electrical Goods In the Hardware Store.

BY W. P. STEWART.

In considering the advisability of handling Electrical Goods in connection with the Hardware business, the first question is, Does it pay? The experience of the writer is that it does pay in more ways than one.

In the first place, there is a good percentage of profit on the amount invested; in fact, as good as on any line of special or fancy goods usually handled.

In the next place, it evinces the spirit of enterprise and progress that should obtain in every modern Hardware establishment, and shows that it is up with the times.

NO ONE QUESTIONS

the value of this reputation in a business house. Energy, a complete stock and a comprehensive knowledge of the business are sometimes more profitable in the long run than cutting prices.

Provided the stock is not too large and varied, the labor attendant upon handling Electrical Goods is imperceptible, and is not worth considering in the discussion. As to space required, a case less than 3 feet square or a small wall space is ample to display as large a variety of Electrical Goods as it is desirable for a retail house to handle. Several of the manufacturers in this line have prepared at moderate cost just such

A DISPLAY BOARD

as is desirable. Electricity is something understood by few, but of interest to all, and such a display always attracts attention. Many persons who perhaps had no idea of purchasing anything of the sort, or, if they had thought of it, were deterred by the impression that such things cost a great deal, upon learning that, say, $3 or less would pay for a complete electric bell outfit they will invest.

The remark is often made that such things will do for people of means. In point of fact it is to persons of moderate means and with few servants that such conveniences are of the greatest value, while the amount of bother avoided by the use of a simple system of electric bells and speaking tubes has to be known to be appreciated. Of course electrical goods will not

SELL THEMSELVES

any more than other goods will, so it rests with the salesman to appropriately and in a pleasing and interesting manner call attention to the desirability of such appliances. It is not necessary that he be an electrician in even a very limited sense of the term, although some knowledge of the subject is of value, and can be very easily acquired in this electrical age.

It is of great importance in offering such goods not to claim too much. Do not let the desire to make a sale lead you to convey the impression that there is no danger of a bell getting out of order, or of a battery getting weak or giving out. Such things will happen, and it is well to call attention to the fact that the necessary material for maintenance can be easily and cheaply procured.

DIRECTIONS

frequently accompany the outfits furnished by manufacturers, and any person of average intelligence can put them in operation.

In regard to installation, if there is an available man in the house who can be intrusted with the work it would add to the profits, but except in large cities it would hardly pay to keep a man for such work alone. In every community, however small, there is generally some handy man who can do such jobs for a moderate consideration. There are two technical points which it will not be out of place to mention in this connection, a neglect of which has given more trouble than anything else in ordinary domestic work. These are neglect in

SPLICING AND TACKING

up wires. Insist upon long, clean bright and tightly twisted splices, covered with insulating tape, and never under any circumstances let one staple or tack be driven over two wires. Good outfits have often worked for months and then refused to respond to the strongest battery power simply because corrosion had ruined a loose or uncovered splice, or crossed a current where one tack held two wires. Sometimes plastering has to be torn out to get at such work or new wires run outside. Such carelessness does much to hurt the sale of electrical appliances.

In the opinion of the writer the Hardware dealer who can in a moderate way handle these goods to advantage will do well to confine himself to

DOMESTIC APPLIANCES,

which may almost be classed as House Furnishing Goods. The heavier articles in this line, such as are used by street railways and electric lighting stations, can be left to houses which handle such goods exclusively. Call Bells in sets, ready packed and complete, are the best sellers. These can be had with various styles of Bells and pushes or pulls. A neat and familiar device, and one which appeals strongly to every lady, is the floor push to be used under the dining table for communicating with the kitchen. A simple code of signals makes this a great convenience.

The ordinary annunciator, for indicating the source of the call, is a familiar appliance, and is so moderate in price that it can be advantageously handled. A careful examination of the catalogues of several large manufacturers in this line would convey very clear ideas of the many domestic uses to which this great servant of man can be applied.

One of the simplest methods of illustrating the operation of ordinary Bells is to have a push button at the front part of a store and a Bell at the rear or some distance away. This conveys a much better idea of its uses than when the button and bell are both attached to the same small box.

A small stock is all that is needed, as it is so easy in these days of rapid transportation to replenish.

A GOOD ASSORTMENT,

although perhaps not complete, would include the following:

One-half dozen assorted Bell Sets in boxes.

One-half dozen assorted Box Bells, 2½ to 4 inches.

One-half dozen extra Cells Leclanche or other good battery of the same class.

One dozen assorted Wood Pushes.

One dining room Floor Push.

One Floor Push with 6 feet of extension cord and Push for table.

One Circuit Closer to use in connection with an old style door bell pull.

Two dozen extra Zincs.

Two dozen bags Sal Ammoniac.

Ten pounds No. 20 Annunciator Wire.

One two-point Annunciator.

One four-point Annunciator.

One pound package ½-inch Adhesive Tape.

One bronze Door Pull.

One 24-inch bell hanger's Gimlet.

Burglar alarms and gas lighting may be attempted, but as they require a greater amount of labor and technical knowledge, and are more liable to get out of order, had perhaps better be omitted by the average Hardware man.

MEMORANDA.

THE SHOW WINDOW of the hardware store of Weber & Brother, 2209-2211 North Front street, Philadelphia, Pa., is one of more than ordinary beauty and attractiveness, it not being too crowded with display material, and that which is displayed is arranged with excellent taste. The window has another feature which will be more than ordinarily interesting, in that the cutlery and polished steel goods shown have been on display since the window was trimmed for last Christmas, and yet show no marks of tarnishing or dust. The window is made practically air tight, the doors shutting against felt and secured by a tight drawing refrigerator door latch. This window occupies the center of the front and is very wide. Doors enter the store on each side of it and smaller windows are at the sides of both of the doors. These windows show attractive seasonable articles in the house furnishing line.

ON JUNE 1 Louis S. Coe retired from the firm of Edward P. Haff & Co. of this city, manufacturers of Hardware specialties, and will continue in the same business as president of a corporation styled Coe Mfg. Company, 98 Duane street, New York. This concern will manufacture a complete line of specialties in Cork Screws, Tape Measures, Tweezers, Key Chains, Hair Curlers, &c., as well as a large assortment of House Furnishing Hardware. Mr. Coe, who is well known to the Hardware and specialty trade in this city and vicinity, is preparing to bring out a number of useful and attractive articles for the fall trade.

The County Council of London, England, has ordered that all signboards be made of metal, much to the disgust of the carpenters.

STOVE TRADE NOTES.

The Chicago Stove Trade.

The Chicago stove houses are not overrun with business at present. It is usually dull at this time, however, being between seasons. The spring trade is over and fall trade has hardly opened up. Travelers are out pretty generally, but have thus far covered only a small portion of their territory. Here and there some fairly prosperous localities have been struck and satisfactory orders obtained, but between them too often intervenes a wide gap. While manufacturers would like to see a much larger trade in progress, it is a question whether they would not still more increase their anxiety over the probable outcome. As general business conditions are enforcing economy among the people, retail merchants must necessarily be careful in laying in stocks of any kind of goods. But if they were to purchase stoves heavily, in apparent defiance of a day of reckoning, there would be a much closer scrutiny of credits and orders would perhaps be curtailed at the factory end. It is better for stoves to move slowly from warehouses and be paid for promptly than to be rushed into merchants' hands and finally settled for on the basis of so many cents per dollar. Under existing conditions, therefore, business is about as good as can or should be expected.

In reviewing the spring trade, one is struck with a rather remarkable fact. It would be supposed that high grade goods would suffer more seriously than cheaper ones, with the known curtailment in the purchasing power of the people. While this has been the experience of some manufacturers, it was by no means general. Many of them report a less per cent. of shrinkage on their business in first-class ranges, for instance, than in cheap ranges and cooks. Certain styles are growing in favor, notwithstandsng their higher price, and the smaller falling off in their sales indicates a positive gain, which will, of course, show up handsomely when times improve and the masses can again consult their tastes without such close reference to their pocketbooks. They are being educated to the use of better articles in their kitchens ss well as neater furniture in their parlors; and as a stove or range is expected to last a great many years, the additional price for a high grade stove is not a serious matter if the time has come when one must be bought.

This naturally brings up the question of prices. No weakness in price has yet developed among manufacturers. They state that their customers are making no demand for better rates. If they wish to buy stoves they are apparently satisfied to pay the price asked when assured that it is an unvarying price to all. Merchants as well as manufacturers realize that no more stoves would be sold even if the price were cut in two, and as long as prices are fair and not so high as to be prohibitory they are not disposed to press vigorously for a reduction. The action taken by the manufacturers at their recent convention thus seems to be well sustained. It would be very unwise to abandon such a conservative policy in the hope of increasing business. Demoralization would inevitably ensue and merchants would reap no benefit from it, while manufacturers would be greatly injured.

Looking to the future, ground for considerable encouragement can be seen. Last year witnessed the culmination of a series of depressing influences such as this country never before experienced. As "the mill can never grind again with the water that has passed," so business cannot again suffer from the misfortunes it hss once passed through. The panic is over, the currency question has been settled, liquidation has run its course, the banks are loaded with money and the work of relaying the foundations of business prosperity is well under way. Labor troubles are disturbing us at present to some extent, but they must soon be ended in the nature of things. The number of persons finding employment will continue to increase. From this time forth we may expect to show a steady advance in the direction of better trade and an enlarged spirit of enterprise among the people. Orders for stoves placed during the next two or three months will not be canceled as they were last year, but will be duly filled and more stoves will be ordered after they are sold.

ADVICES from Sioux City, Iowa, indicate that slight hopes exist of the resumption of business by the Sioux City Stove Works, whose plant is in the manufacturing suburb of Leeds. An attempt is being made to locate a number of small manufacturing establishments from other points in the buildings formerly used by the stove works. Should this be accomplished it will of course settle the future of the plant with regard to making stoves. All the other manufacturing concerns at Leeds are now in operation, those which were carried down last year having been reorganized.

Sport Among Stove Men.

The Saturday half holiday last week was made good use of by the employees of the Union Stove Works of this city, when 38 of their number repaired to the spacious grounds belonging to Alfred Semler, keeper of the hotel at Grant City, Staten Island. The boys had prepared an elaborate programme to keep them busy until 10 o'clock that night, and had a most enjoyable time.

Among the many events arranged for the day's outing was a match game of base ball in which part of the store force, known as the "Paragon B's," was pitted against the tin shop boys, who called themselves the "Flirt B.'s," resulting in a victory for the latter by a score of 34 to 19. The trophy, a beautiful stove offered by the firm, was carried off by the victors, who also secured an appropriate medal, for which they contested. The umpire, Mr. Tilson, in this game fared much better than some of the players, who, being rusty for such violent exercise, came out of the game rather sore, to say the least, three of the number, Messrs. Schuler, Pennell and James Myers, sustaining many scratches in their endeavors to extricate themselves from the meshes of a barb wire fence, in which they became entangled after chasing the ball outside the grounds. The teams lined up in the following order:

Flirt B.	Paragon B.
T. Tilson, P.	R. L. Myers, C. and Captain.
J. Dougherty, C.	L. Hatfield, P.
J. Gould, 1st B.	R. Smith, 1st B.
P. Hammill, 2d B.	H. Davis, 2d B.
H. Young, 3d B.	H. E. Sherwood, 3d B
A. Van Sise, S. S.	W. T. Edwards, S. S.
E. Schuler, R. F.	J. H. Myers, L. F.
C. Reick, L. F.	W. Froel, C. F.
J. Worster, Captain, C. F.	G. C. Pennell, R. F.

Umpire—John Tilson.

The second event was a 130 yards dash, in which Mr. Worster of the shop outran by two seconds the dignified bookkeeper of the company, P. J. O'Hanlon; but the laurels of the store were retrieved in a like event between Master D. Strade the tinshop apprentice and Master James Dowling, errand boy, who outran the former by four seconds. The fourth event was a running race between E. Suarez and R. Arguiello, two invited guests, in which the latter was best man. The fifth event, a 130 yards dash between Louis Hatfield and Henry Specht, two of the drivers, was won by Mr. Specht, who was two seconds ahead of his rival at the finish. The sixth event, a penny pitching contest between John Dukes of the shop and Harry Chapman of the store, was won by two pennies by Dukes after a close and exciting contest. One of the most laughter provoking events of the day, and which called forth bursts of applause and vociferous urgings on the part of the respective admirers of the contestants, was a jig contest between Mr. Chapman of the store and Mr. King of the shop. Under the spur of continued shouts of encouragement they kept up the dancing for 15 minutes, when the on lookers called it a draw, out of pure sympathy for the principals. In a lot

drawing afterward the contest was decided in favor of Mr. Chapman.

After supper, to which all sat down at 6 o'clock, and for which all had most voracious appetites, ten pins was indulged in. The following is the *menu* of the supper:

Soup à la Revertible Flue.

Clam Fritters with Fancy Nickel Skirt and Legs.

Roast Beef with Low Hot Closet and Reservoir.

Roast Veal with Asparagus and Lettuce elaborately trimmed with Tile.

Roast Chicken with Burnished Edges.

Cream Cakes with Duplex Grate.

Coffee and Direct Draft Segars.

The bowling contest was participated in by the following:

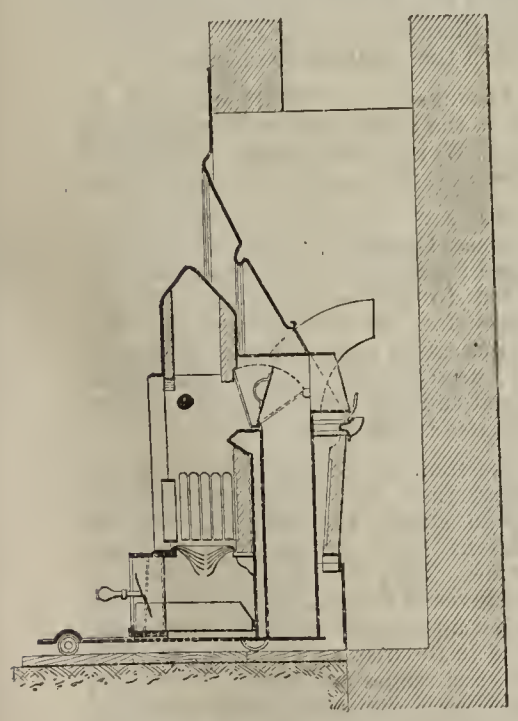
Store.	Shop.
G. C. Pennell,	J. H. Pratt,
J. H. Myers,	John Edwards,
H. E. Sherwood,	E. Jacoby,
R. L. Myers,	E. Schuler,
W. T. Edwards,	C. Reick,
P. J. O'Hanlon.	J. Worster.

It resulted in a victory for the shop hands by a score of 529 to 522.

Charles Specht, a former employee, furnished the music for the occasion on an accordeon, of which he is certainly a master, playing as he does with his nose, ears and chin, and imitated various musical instruments, such as bagpipes, violin, banjo and piano. It was 10 o'clock when the boys boarded the train for home, singing "Two Little Girls in Blue," "Playmates," and several other songs of a *passé* character, and at the imminent risk of being sat upon by other inmates of the car, or of being ejected by the conductor. All, however, voted it one of the grandest outings, marred only by occasional showers, they ever had. Among those present whose names do not appear among the contestants were: W. Trass, F. Rubenstrunk, C. Kircher, William Specht, C. Sabine, P. Wilson and John Kaiser.

English Grate Construction.

An interesting form of open fire or grate which is being introduced to the English market is that represented by



Vertical Section through an English Open Grate.

the sectional view in the accompanying illustration. The arrangement of parts is such, the manufacturers claim, as to result in economy of fuel combined with great efficiency. The device is so made that it may be easily inserted in a fire place, and is furnished with or without a front. The body of the apparatus surrounding the grate is divided by means of fire brick into several chambers, the fire itself constituting the middle division. Above this there is an air flue, for the purpose of carrying the heated air to the fire in order to promote combustion. In the air flue is a register, for the purpose of either allowing a direct draft into the chimney, as in the case of an ordinary grate, or to discharge the products of combustion through the flues at each side of the grate. The arrangement is such that the flues can easily be cleaned by removing covers provided for the purpose, which, in turn, may also be used as ventilators. Where a front is provided there are two sliding mica doors, through the panels of which the light from the glowing coals may stream into the room, thus adding to the cheerful effects produced. The front may be made entirely of cast iron or fitted with tile panels, behind which the mica doors slide when opened. Some of the fronts have perforated borders, through which cold air from the room enters at the bottom, and after circulating about the body of the grate issues at the top in a highly heated condition, thus maintaining a rapid circulation and creating a uniform temperature throughout the apartment. We understand that a room may be warmed in three ways. If the mica doors and register at the back are closed, the fire burns in accordance with the position of the lower sliding door, and the grate yields the largest amount of heat. In the second place, if the mica doors are closed and the register at the back left open, the fire still burns in the manner indicated above, but as there is a direct draft into the chimney only a small quantity of the heat developed is discharged into the room. In the third place, if the mica doors are opened together with the register the fire burns as in the ordinary grate, and, while assisting ventilation, gives very little heat to the room. Ventilation can be secured in the manner indicated by opening a valve in the cleaning covers at the bottom of the side flues. This causes the air from the room to at once be drawn into the flues, and while reducing the draft for the fire gives ample ventilation.

ODD PLATES.

The Excelsior Steel Furnace Company, 38 and 40 West Monroe street, Chicago, have just brought out a new list of furnace fittings. It is printed on a large sheet, 15 x 27 inches, giving illustrations of the various kinds of fittings made by the company. A large addition has been made to the line of stacks and branches. These are now furnished in lengths from 19⅝ inches to 13 feet 6 inches, and can be placed in position without patching or soldering. No solder is used on the hot air pipe, but the joints are double seamed together, while the swedging on the last joint of a length is done with the ridge entirely above the surface, leaving the inside perfectly smooth. This pipe is made up in sections from 14 inches to 5 feet 8 inches in length, each section being complete. Other goods shown are elbows, angles, collars, boots, register boxes, casings, bonnets, and miscellaneous fittings. The price-lists published are very comprehensive, covering all sizes, styles and descriptions of regular and special fittings.

The foundry of Burdett, Smith & Co., at Troy, N. Y., will not resume operations until after July 4. For several weeks the resumption of business has been anticipated by the employees. The foundry has been closed since early last December.

Operations were resumed at the stove plant of Bussey & McLeod, Troy, N. Y., last Monday. The usual force of men was put at work.

Gen. Robert Shaw Oliver, superintendent of the Albany plant of Rathbone, Sard & Co., has been appointed a member of the Civil Service Commission of the city of Albany by Mayor Wilson.

The latest catalogue issued by the Fuller & Warren Warming & Ventilating Company, 43 Milk street, Boston, Mass., is an exceptionally handsome publication. It is of oblong shape, bound in silk, with a finish of gold, while the back is of white with graceful gilt design and the words "Warming and Ventilation" printed in red. The inside of the catalogue is in perfect keeping with the handsome binding. The pages are faintly tinted with white and cream, alternately paneled, the typographical work being done on a paneling of cream color, while the engravings, of which there are many handsome ones, are on a white panel surrounded by a border of the latter color. Large engravings show many school houses and halls and other important buildings in which the Fuller & Warren Warming & Ventilating Company have installed the heating apparatus. Vignettes of some detail of architecture or ornamentation of buildings add much to the charm of the engravings. Of course, the important feature of the work is the description of the warming system that they apply, many interesting diagrams being presented, and full accounts given of the apparatus itself. At the close of the book are many references.

The Southern Stove Works, of which Kiechle, Brentano & Oberdorfer are proprietors, Evansville, Ind., issue an attractive pamphlet, handsomely printed on delicately tinted paper, illustrating the new patterns for 1894 of Our Leader specialties. These include four and six hole wood ranges, embodying the latest improvements and ornamented in a rich and effective manner; a soft coal heater, which is claimed to be mounted absolutely air tight and capable of holding fire 24 hours with soft coal; an attractive Franklin, made in three sizes and having large sliding mica feed doors, capacious ash pan, heavy sheet steel back, iron linings, draw center shaking grate and fire pot, removable through the feed door, and Our Leader four-hole cook stove, made in five sizes for coal and wood. The front cover of the pamphlet is ornamented with a picture of the train containing the company's large shipment of stoves on September 10 of last year, the contents of the train weighing 462,300 pounds, the freight charges being $3107.25.

The Art Stove Company of Detroit, Mich., last week made two shipments of oil heaters to Antwerp and Brussels. The company expect to do considerable business with European countries and are in receipt of numerous inquiries from abroad. They are running their factory with a full force, ten hours a day and six days in the

week. The outlook for a large trade is considered good.

THE JOLIET STOVE WORKS of Joliet, Ill., are favoring their customers with sheets of blotting paper, one side of which carries a calendar for the month of June and an illustration of Moore's Air-Tight heaters shown with and without casing.

THE SILL STOVE WORKS of Rochester, N. Y., issue an attractive folder giving some interesting information relative to the Sterling range, which they manufacture in the usual modifications. This stove is one of the latest additions to the company's already extensive assortment, and is ornamented in a style to please the most fastidious. The effects are rich and artistic and the stove as a whole has a substantial, well made appearance. Particular attention is invited to the fire box, which is extra large, oval in form and has an extra heavy brick lining; also to the company's patent lift-out hearth, which rises up instead of sliding out or swinging to one side, and to the square full size oven which is fitted with patent transparent ventilating double door. By means of the latter fresh air is continually introduced into the oven, while the transparent inner door, fitted with two clear sheets of best India mica, enables the contents of the oven to be seen from any point in the kitchen, while at the same time no risk is run of having a delicate piece of baking spoiled by settling, through the opening of the door. The flues, which are claimed to embody the advantages of both the two-flue and sheet flue systems, without the faults of either, are deep and can be cleaned from the front of the range.

WILLIAM W. CORNELL, who recently died at Poughkeepsie, N. Y., was a native of Troy, N. Y., where he was born 73 years ago. He was a son of the late Latham Cornell and with his father was for many years in the stove business at Troy. The deceased removed from Troy to Poughkeepsie 35 years ago.

THE NEW OFFICE BUILDING of Cribben, Sexton & Co., adjoining their stove foundry on Erie street, Chicago, is now nearly completed and will shortly be occupied by the firm.

THE PENINSULAR STOVE COMPANY, Detroit, Mich., favor us with samples of lithographed hangers with which they are this season supplying their customers for advertising purposes. These are of the usual style and make up, being provided with metal bands at the top and bottom and an eye for hanging upon the wall. The design in each case, however, is far in advance of the general run of advertising hangers, and is of a character to warrant its preservation rather than find a place in the waste basket of the dealer receiving it. In each case the design is different, so as to lend a pleasing variety to the collection. As hangers are issued for advertising purposes it is natural to find some reference to the company's goods printed upon them. The upper left hand corner bears a *fac-simile* of the company's trade-mark, while in the opposite corner is a picture of some one of their leading specialties. The lithograph work is beautifully executed in colors and the designs exceedingly rich and effective.

WE HAVE RECEIVED from the Michigan Stove Company a sample of the patent Schafer lamp shade which they are now furnishing their agents as an advertising device. It consists of a tin holder or spreader to fit on the chimney and a decorated paper shade which folds flat. The *Garland Magazine*, which has also been received, is a 16-page publication, filled with literary miscellany and occasional allusions to Garland stoves and ranges. It is intended to be furnished to dealers for distribution in their immediate vicinity. In such cases the dealer's name is printed on the magazine and copies are furnished him at a very low rate. Circulars are also inclosed giving practical hints in advertising Garland stoves and ranges.

ISAAC A. SHEPPARD & Co. of Philadelphia have been busily engaged in extending their lines of goods, particularly as regards furnaces. Their heating stoves this season will embody some important modifications and improvements, and their line of Fidelity ranges has been enlarged and improved. They are about to place on the market a new four and six hole range in three sizes, bearing the name Royal Excelsior. The range has an end ash pit, high hot closet and reservoir, and will doubtless be in good demand when the season opens.

THE MOUNT PENN STOVE WORKS of Reading, Pa., have issued an eight-page catalogue under the heading "Cellar Furnaces." In it are described and illustrated the Radiant hot air portable furnace, steel drum and crab construction, with single or double casing; the Model portable hot air tubular furnace, and the Palace, a new furnace just introduced as a very cheap and effective cellar furnace. The latter is a steel drum furnace with horizontal air flues and made in three sizes. The last page of the catalogue is devoted to dampers and trimmings.

THE EXCELSIOR STEEL FURNACE COMPANY of 38 and 40 West Monroe street, Chicago, are filling their warehouse at above numbers with furnaces, boilers, heaters, furnace fittings and supplies in anticipation of an active fall trade. At the opening of the shipping season they expect to have on hand fully 1000 furnaces and boilers.

THE FRONT RANK STEEL FURNACE COMPANY, St. Louis, Mo., have moved from 713 North Main street to larger and more commodious quarters at 705–707 North Main street. In their new location they will occupy two buildings, each four stories in hight. The first floor will be utilized as an office and showroom. Particular attention will be paid the latter. It will be inclosed by partitions of finished white pine, the upper portion being of glass, arranged so as to swing outward, thus obtaining all the necessary ventilation. Arrangements regarding the decoration of the sample room and office are not as yet completed, although it is expected that ornamental sheet iron ceilings and side walls will be used. The sample room will contain a full line of their Front Rank steel furnaces, which will be displayed with and without casing, and also in sections. They will also show their Front Rank water heater, which is just now creating quite a stir in the trade. This water heater was not completed until the latter part of the winter season and their trade was naturally limited. They have completed a number of contracts, however, and those that have been used have given entire satisfaction. The second floor of their new plant will be used as a sheet iron and sheet steel shop, the third floor as tin shop, while the fourth floor will be utilized as a pattern shop. The change made in the location of their plant will enable them to increase their capacity by at least 50 per cent. The two buildings occupy ground 50 x 180 feet.

BUCK'S STOVE & RANGE COMPANY of St. Louis, Mo., are directing the attention of the trade to the iron clad guarantee which they give in connection with their line of Buck's stoves and ranges They are distributing *fac-similes* of the warranty which they give with every stove made, and point out that the reason their stoves are more durable than others is because no scrap or old iron is used in their construction. Accompanying the warranty is a neat folder entitled "Health and Economy," which deals with the merits of Buck's stoves.

THE RAPID TRANSIT STOVE & FURNACE COMPANY of Baltimore, Md., have issued an illustrated catalogue of their specialties made under the patents of J. B. Oldershaw. Attention is invited to an interesting assortment of heating stoves, furnaces, fire place heaters, &c., the illustrations being accompanied by descriptive letterpress. Instructions are given for setting the Grand Rapid and Rapid Transit fire place heaters, as well as for the Resplendent heater. Some of the goods are made as double heaters, these including the Delta, Diffusive and Rapid Transit.

HESS, SNYDER & Co., Massillon, Ohio, are distributing to friends in the trade copies of their 1894 furnace catalogue. It is a book of 84 pages bound in board covers and gives a detailed description of the Boomer furnace, which the makers state has been thoroughly tried and tested. They refer especially to its durability, economy and cleanliness. The illustrations show the furnace in sections and general views and adapted for high and low cellars, Ample descriptive letterpress accompanies the illustrations, and the matter is presented in such shape as to prove interesting and valuable to dealers handling these goods. Not the least important feature of the publication is a partial list of churches and schools in which the Boomer furnace is used, as well as a long list of testimonial letters from those who have practically demonstrated the merits of the heater.

ADVICES FROM Phillipsburg, N. J., are to the effect that the Phillipsburg Stove Works will operate their plant three days a week until further notice.

WE ARE INDEBTED to the Carton Furnace Company, Utica, N. Y., for a copy of a circular which they have received from Stearns Brothers, Detroit agents for the Carton furnaces. The circular gives a list of names of some of the dealers who handle the goods named and who have been using them from one to ten years.

HANSELL & BELSON have now arranged their showrooms, at 144 North Second street, Philadelphia, with the different lines of goods they will handle. They will make a specialty of the stoves of Charles Noble & Co. The second floor front will be entirely devoted to the display of their new Liberty steel ranges and the Dazzle cooker, made by the Philadelphia Stove & Iron Foundry Company. They are selling four grades of oil stoves, of which the Game and Enterprise are leaders. They also handle five grades of gas stoves and ranges, the Enterprise line of Luther & Lederhos occupying the leading position. Their gasoline leader is the Aurora Process, and they sell Moon's

patent flame spreader oven for all their oil, gas and gasoline goods. They also have the agency for their section of the Grinberg Star elbow. They have adopted a trade-mark in which Iron King and Liberty stoves and ranges are the features.

THE READING STOVE WORKS, Reading, Pa., propose starting up in a few days their Millmont plant, with a full force of workmen in all departments. The reason for this is that their warehouse at Foundry No. 2, which with Foundry No. 1 has been running full thus far the present year, is filled with goods, and as the future production must be stored at Millmont, it is much more convenient for the company to make the stoves there than it is to turn them out in Reading and haul them ¾ mile to the warehouse at Millmont. As soon as operations are resumed at the Millmont plant Foundry No. 2 will be closed, for the reason that present trade conditions do not warrant operating more than two-thirds of the company's full capacity. Business is very quiet just now, but the outlook for the fall trade is regarded as favorable. From the above it will appear that the starting of the company's Millmont plant is not due to the receipt of "a large order for heaters of a special size" which cannot be made at their plant in Reading, as some of the newspapers have stated.

THE PITTSTON STEEL RANGE COMPANY, Pittston, Pa., with a capital stock of $10,000, were chartered on Friday, May 25, with the following directors: George B. Reap, M. N. Donnolly, James Kennedy, John Brown and Dr. Joseph Reap.

THE DENVER, COL., NEWSPAPERS state that on the 28th ult. the Kibler Stove Works met with an annoying loss in the destruction of a portion of their patterns by a fire which originated in an adjacent plumbers' supply foundry.

THE DIPPO MFG. COMPANY of Cleveland and Chagrin Falls, Ohio, have issued an illustrated catalogue of three specialties in their line of Ferrosteel ranges. These goods are made from original patterns and are constructed in the company's works located at Chagrin Falls, about 10 miles out of Cleveland. The ornamentation is of a pleasing character and the constructive features such as to command favorable attention at the hands of the trade. The catalogue consists of 16 pages, presenting halftone illustrations of several varieties of the Ferrosteel ranges. Accompanying the engravings we find descriptive letterpress together with tables giving the sizes in which the stoves are made, the dimensions of the ovens' code words and prices.

We are indebted to Louis L. Tribus, C.E., 84 Warren street, New York, for a pamphlet copy of a paper read by him last February before the American Society of Civil Engineers, of which he is an associate member, on the subject of driven wells of the Plainfield, N. J., water supply system. The paper gives a very clear and concise account of the water supply system adopted at Plainfield, and numerous engravings make plain all the essential features of it. The wells have been in operation for over two years with the most satisfactory results as to the quality and quantity of water, and are but one of the many examples of the efficiency of the driven well system of supply. In the discussion following the paper reference was made to the similar systems at Natchez, Miss., Topeka, Kan., Dayton, Ohio, and other cities. Mr. Tribus was resident engineer during the construction of the work and is well qualified to express opinions on the important matter of water supply.

SCRAP.

ACCORDING to the monthly Treasury statement of imports and exports for April, the amount of tin and terne plates held in bond in the United States on April 30, 1894, was 49,246,079 pounds, valued at $1,240,992, as compared with 25,114,881 pounds, of the value of $681,071, held on April 30, 1893, showing an increase of nearly 100 per cent. This increase has become still larger during the month of May and is attributable entirely to uncertainty in regard to the tariff.

THE BALTIMORE IRON, STEEL & TIN PLATE COMPANY are moving their plant from Clinton and Second streets, Canton, to Locust Point, Md. The firm have secured a lease for three years on the property and plant of the old Coates Rolling Mills, at Locust Point, with the option of purchase.

BRUCE & COOK, 186–190 Water street and 248 and 250 Pearl street, New York, are offering to the trade a new brand of American roofing tin named Petrel, which is being made especially for them. It is described as a highly finished bright coated terne plate equal to P. T. L. Another specialty of the firm in American roofing plates is W. T. R., a dark finish terne of Worcester grade. Messrs. Bruce & Cook report a large and growing demand for these domestic plates.

A MEMBER OF the New York metal trade, who has recently returned from a Western tour, in the course of which he visited a number of the American tin plate works established west of the Alleghanies, describes their importance and activity as astonishing. Leaving the city in the character of a skeptic open to conviction, he has returned an enthusiastic convert. The progress of the large tin plate concerns established in Indiana, Western Pennsylvania, Ohio and Missouri he found to be remarkable. All were filled up with orders and only feared the effects of the coal strike. The magnitude of the works of the St. Louis Stamping Company at St. Louis, Mo., appears to have produced a particular impression on this individual's mind. That tin plate manufacturing is already an established and important industry in this country is, he says, not in the least doubted in the West.

LAUFMAN TIN PLATE COMPANY, whose works are located at Butler Junction, on the West Penn Railroad, with post office address at Freeport, Pa., issue a neat circular calling attention to their brands of American roofing tin, and giving a number of flattering testimonials from metal roofers in various parts of the country in regard to their plates. In addition to their well-known brand of guaranteed roofing tin—Laufman's Apollo, the firm are making and offering to the trade the following roofing plates: Tip Top, described as a machine made, full coated and squared terne; Allegheny, machine made and squared, and Freeport, a hand redipped and resquared plate. The last named is the latest addition to the firm's products. All these plates are made with a palm oil finish. The Laufman Tin Plate Company roll their own black sheets from best decarbonized steel, and all their plates are guaranteed to double seam.

N. & G. TAYLOR COMPANY, Philadelphia, Pa., report that the output of tin plates for the week ending May 26 was the largest since they started their works some two years since. They are enjoying an excellent demand for their bright and roofing tins.

ESTIMATES AND PLANS are being prepared for a tin plate plant to be added to the Lalance & Grosjean Mfg. Company's rolling mills, at Harrisburg, Pa. The company's mill in that city has a large capacity in the production of black sheets for tinning purposes. Most of this product is used in the firm's own tinware factory on Long Island, and the balance has been in great request by tin plate makers.

A FIRE was discovered on the morning of June 2 on the fourth floor of N. & G. Taylor Company's store, at 395 Branch street, Philadelphia. The flames, which were sufficiently fierce to melt the pig tin stored there, were fortunately confined to that one section of the building by means of the iron fire proof doors, and the fire was quickly subdued. The loss is estimated at about $2000, and is fully covered by insurance. The origin of the fire is unknown.

IN THE BURNING, last month, of the Clyde Line wharf, on the East River, New York, a considerable number of boxes of imported tin plates were destroyed or damaged.

A LONDON CABLE DISPATCH reports that the works of the Pontymister Tin Plate Company, Newport, and of the Maesteg Tin Plate Company, Llwydarth, two of the most important tin plate works in South Wales, started into operation again this week.

New Publications.

DIRECTORY OF THE IRON AND STEEL WORKS OF THE UNITED STATES, CANADA AND MEXICO. Compiled and published by the American Iron & Steel Association, Philadelphia.

James M. Swank's directory of the iron and steel works has always been the closest approach to the ideal of such a publication with which we are acquainted, and is thoroughly appreciated in the trade, by which it is regarded as a standard work. With the growth of the industry the difficulties attending its compilation are growing steadily. It is so thoroughly known that it requires little more than the announcement that a new edition has been issued to commend it to those interested. It contains as usual a full list of the blast furnaces, rolling mills, Bessemer steel works, open hearth steel works, crucible steel works, plate and sheet mills, cut nail factories, stamping works, forges and bloomaries, wire rod and wire mills, wire nail factories, bridge building works, iron and steel shipbuilders, horse nail works, locomotive works, cast iron pipe shops, wrought iron pipe works, car axle makers, car wheel foundries, and car builders. Similar information is furnished for Canada and Mexico.

THE TIN MILL READY RECKONER. By Ambrose Beard, New Philadelphia, Ohio. Price, 75 cents.

Mr. Beard's "Tin Mill Ready Reckoner" is a handy little pamphlet which contains a series of tables of calculations for quickly computing the wages of tin mill rollers, doublers, heaters and shearmen under the Western scale.

TRADE REPORT.

The Iron Market.

Pig Iron. — In the New York market, although some of the Southern furnace companies have advanced their asking prices, there is no evidence that buyers are paying more. There is some scarcity, however, in Soft grades. While the threatened advance in freight rates has stimulated shipments the fact remains that the current demand is not heavy. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No 4 (Foundry Forge) is $9.75 @ $10.25.

There is more doing in Pig Iron, and prices, if not fractionally higher, are certainly well maintained in the Philadelphia market. There is no very strongly defined increase in the demand, but with so many furnaces banked, and the prospect of higher freights from the South and West, holders are less urgent in making sales, unless at figures that come pretty close to $11.75 for No. 2 X, and $10.50 @ $10.75 for ordinary to good mill Irons. Several sales of 1000 tons each and upward have been made of the ast mentioned at $10.50, which appears to be an inside quotation for that class of Iron, although there are full supplies at that figure for Philadelphia deliveries and at 25¢ @ 30¢ less at points such as Harrisburg and York. General quotations for Philadelphia and equivalent points are about as follows :

andard No. 1 Foundry X....	$12.50 @ $12.75
Standard No. 2 Foundry X...	11.50 @ 11.75
No. 2 Plain.....	10.75 @ 11.00
No. 1 Soft.....	11.50 @ 11.75
No. 2 Soft.....	10.75 @ 11.00

Advices from Chicago indicate that the market is hardening. Large sales of local Coke Iron have been made at firm prices and offers are refused which would have been accepted only two weeks since. Manufacturers again appear to be in command of the situation and consumers are gradually recognizing this fact. Southern Coke is quiet. Such Iron as is now selling is on the basis of a price at the furnace, and not delivered, as makers will not take chances of an advance in freight rates. Sales of Lake Superior Charcoal Iron are reported in somewhat larger quantity than for several weeks past. Bankrupt stocks are now disappearing and the market is working into better shape. Quotations are given as follows for cash:

Lake Superior Charcoal.....	$15.00 @ $15.50
Local Coke Foundry, No. 1...	11.25 @ 11.50
Local Coke Foundry, No. 2...	10.50 @ 11.00
Local Coke Foundry, No. 3...	10.00 @ 10.50
Local Scotch.....	11.50 @ 11.75
Ohio Strong Softeners No. 1..	13.00 @ 13.50
Southern Silvery, No. 1.	..... @ .....
Southern Silvery, No. 2.....	..... @ .....
Southern Coke, No. 2..... ...	10.00 @ 10.35
Southern Coke, No. 3.....	9.75 @ 10.00
Southern, No. 1, Soft.....	10.25 @ 10.50
Southern. No. 2, Soft.....	10.00 @ 10.25
Tennessee Charcoal, No. 1...	. ... @ .....
Tennessee Charcoal, No. 2....	..... @ .....
Alabama Car Wheel.....	17.50 @ 18.00
Jackson County Silvery.....	15.00 @ 16.00

The Pittsburgh market is reported bare of sales and of material as well. Mill Iron is stiffening in price, and $9.75, Pittsburgh, is the minimum price to-day, a sale of 500 tons having been made at that figure last week. There is little or no demand for Foundry Iron, but in spite of this furnaces are asking more money, and it is doubtful if $10.75, Pittsburgh, for No. 2 could be shaded. A sale is noted of 300 tons No. 1 Foundry last week, at a price equal to $11.20, Pittsburgh. In the present situation with no transactions occurring, quotations are merely nominal. For spot deliveries the following prices are quoted:

No. 1 Foundry..	$11.50 @ $11.75 Cash.
No. 2 Foundry.....	10.75 @ 11.00 "

The situation in the Cincinnati Pig Iron market has been much the same as the previous week. Some furnaces with Pig Iron to sell have met the demand quite freely, but there were no large transactions, and yet the aggregate of the jobbing sales was considerable, and while the bulk of trade was for Foundry Coke Iron, there were larger proportionate sales of Southern Charcoal Iron. There are comparatively few Southern furnaces that have Iron to sell, and they are talking higher prices, but the scarcity of fuel is decreasing the demand as well as the supply, for many of the jobbing foundries in the district are closing because they cannot get Coke or Coal. The market closed strong. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke. No. 1.....	$10.25 @ $10.50
Southern Coke, No. 2.....	9.25 @ 9.50
Southern Coke, No. 3.....	8.75 @ 9.00
Ohio Soft Stone Coal, No. 1....	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2....	14.00 @ 14.50
Lake Superior Coke, No. 1.....	12.50 @ 13.00
Lake Superior Coke, No. 2.	11.50 @ 12.00
Hanging Rock Charcoal, No. 1..	17.00 @ 17.50
Hanging Rock Charcoal, No. 2..	16.50 @ 17.00
Tennessee Charcoal, No. 1.....	13.00 @ 13.50
Tennessee Charcoal, No. 2.....	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable.....	16.25 @ 16.75

The only feature of interest in the St. Louis market is the scarcity of No. 1 Foundry. The output of this grade of Iron is very limited, and $8.25 @ $8.50 is now quoted for prompt shipment. The consumption of Iron is limited, which is, however, offset by the limited production. Consumers being unable to obtain their usual supply of Coal, Coke, &c., are also reducing their shipments of Iron, and furnaces have no alternative but to hold the Iron for further instructions. Prices are firmer all along the line, but are not as yet quotably higher. We quote as follows for cash, f.o.b. cars St. Louis:

Southern Coke, No. 1 Foundry.....	$11.00 @ $11.25
Southern Coke, No. 2 Foundry.....	10.00 @ 10.25
Southern Coke, No. 3 Foundry.....	9.75 @ 10.00
Southern Car Wheel.....	17.00 @ 18.00
Lake Superior Car Wheel..	16.25 @ 16.50
Ohio Softeners.....	14.25 @ 14.50

The past season has been a hard one for lake marine insurance companies, owing to the unusually large number of vessels lost on the lakes. The companies are advancing their rates from 50 to 150 per cent.

Metal Market.

Pig Tin.—Wholesale prices have moved slowly but steadily downward, and show for the week a decline of about 0.20¢. The fall is due in part to lower London market, but increasing supplies and dull general trade have helped in some degree. Spot stocks increased last month to the extent of about 305 tons. Thus far this month 225 tons have arrived. There are now afloat 1900 tons. The available supply for early delivery is about 3000 tons, or 750 tons larger than a month ago. European and American visible supply combined was 18,983 tons June 1, showing an increase of 2593 tons since January 1. The demand for Pig Tin for consumption is referred to as commonplace in the extreme. The jobbing price for small lots of Straits Pig is 21¢ @ 21¼¢ ℔ lb for small lots.

Copper.—The market is somewhat unsettled and weak, owing to the placing of orders for a large quantity of Lake Superior Ingot for delivery several months ahead at a very low figure. The amount is understood to be about 10,000,000 lb. Cheap grades of Copper for prompt delivery are rather scarce, but the present requirements of consumers are moderate and business limited in volume. Prices for small lots are unchanged at former quotations.

Sheet Copper.—No improvement worth mentioning has developed in the demand for Sheet Copper. Purchasing by consumers continues on a cautious, narrow scale. Prices are unchanged and firmly held. For small lots from store a 15¢ ℔ lb, net, basis is the rule.

Pig Lead.—A more active general market has been experienced, and at the close it showed a better tone than has been the case of late. Some good sized transactions are reported to have passed, but the current jobbing demand for both Pig and Manufactured Lead presents no new features, either in the way of improvement or the reverse. For American Pig, in moderate quantities, 3⅞¢ @ 4¢ is the ruling price.

Spelter.—There is little business doing in Spelter in this market, which remains dull and somewhat weak. Prices are not, however, any lower. Small lots of Western fetch about 4¼¢ ℔ lb.

Sheet Zinc.—Another sharp advance has occurred in the price of this material during the past week, and it is expected that quotations will go still higher, owing to the closing down of the works, following on the scarcity of fuel. Meanwhile the demand is tame, but enough to cause a steady shrinkage in stocks. Current quotations are 5½¢ ℔ lb for 600 lb casks, and 6¢ for smaller quantities.

Antimony.—Only a routine business is doing, yet enough to keep prices steady. Quotations are unchanged.

Nickel.—About 45¢ @ 50¢ is quoted for fair sized lots, with the usual premium in smaller quantities.

Tin Plates.—The condition of the Tin Plate market is one of uncertainty

and suspense. Business is irregular, being good one day and flat the next, while the general policy continues to be to proceed cautiously with both spot purchases and orders for forward shipment. In the early days of the week some little impetus was given to trade by the placing of a few good sized orders by Southern Can makers, but inquiries from this class of consumers slacked off toward the close of the week. The cold and stormy weather experienced of late has given a set back to canning operations for the present, but requirements from this quarter may again revive with the advent of more seasonable weather. There is a fairly active demand for Roofing Ternes, especially those of domestic manufacture, prices for which are well maintained. General Tin Plate quotations show no radical change. Concessions are, however, less easy to obtain, owing to decreased importations and gradually lessening stocks on this side.

A special cable dispatch from London to *The Iron Age*, dated June 6, describes the British Tin Plate market as firmer. There is more inquiry for forward deliveries, but sellers are asking a large premium and that checks business. Prompt shipments are in poor request, however, with Bessemer Cokes at 10/. Ternes are stiffer on better demand. Swansea quotations are as follows:

Bessemer Cokes, 14 x 20.....	10/	@ 10/1½
Siemens Cokes, 14 x 20.	...10/4½	@ 10/6
Ternes, double box.	.....18/6	@ ..
Charcoals.....	.....13/	@ 15/

Sheet Iron.—Black Sheets for tinning are in particularly good demand, and some heavy sales have been made. Manufacturers' books are well filled with orders, and Tin Plate works are experiencing some difficulty in obtaining a sufficient stock of plates for the purposes of their busines. Other qualities of Black Sheets are in moderate demand, and prices display a firmer tendency. Galvanized Iron is rather more active, with prices firm at 75 % @ 75 and 5 % off for small lots from store.

MATTHAI, INGRAM & Co., Baltimore, Md., issue a supplementary catalogue showing the recent additions to their line. It is to be used in connection with their general catalogue No. 20 or No. 21. They announce also that they have new goods in contemplation and will be glad to receive inquiries from the trade. The present supplementary volume contains 25 pages with illustrations and prices and relates to Dippers, Ladles, Skimmers, Coffee Pots, Tea Kettles, Pails, Buckets, Ash Pans, Oil Cans, &c. A second catalogue that they are distributing is a neat little pamphlet bound in gray with silver lettering, devoted entirely to what they term "Old Time" Tinware, which is the name they use as a trade-mark. Old Time Tinware is wrapped, tagged and labeled, and it is specified that the best care is bestowed upon the packing and shipping. They also emphasize the high grade of the articles. The Ware includes a large assortment of Kitchen Utensils, such as Tea Pots, Coffee Pots, Boilers, Saucepans, Sauce Pots, Cups, Dippers, Bowls, Baking Pans, &c. Among the other articles enumerated are Dinner Kettles, Funnels, Scoops and Wash Boilers. All the goods are illustrated and full price lists are given.

Reports from the Northwestern States point to excellent crop prospects in nearly every district. The promise of a large yield was never better at this season of the year.

Chicago Report.

Scrap.—No change has been made in the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap.....	$7.00	....
Machinery Cast.....	6.00	....
Malleable Cast...	5.00	....
Stove Plate (free of burnt)..	4.00	....
Burnt Iron and Grate Bars..	3.00	....
Sheet Iron and Hoops.. ..	2.00	....
Plow Steel and Breaking Stock.....	4.00	....
No. 2, such as Shovels, Hoes, &c.....	3.00	....
Old Boilers—whole (Iron)....	3.00	....
" (Iron)—cut in single Sheets and Rings..	5.00	....
Old Gas-Pipe and Boiler Tubes.....	5.00	....
Cast Borings.....	3.00	....
Turnings.....	4.00	....
Horseshoes.....	8.00	....
Copper Bottoms.....	....	5½¢
Copper Clips and Heavy.....	....	7 ¢
Heavy Brass....	....	5½¢
Light Brass.....	....	3 ¢
Pipe Lead.....	....	2¼¢
Tea Lead...	....	2 ¢
Zinc.....	....	2 ¢
Rubber.....	....	3½¢

Anthracite.—The demand has been excellent for the past week and an advance of 25¢ ℔ ton has been made. Carload lots of 12 net tons or over are now quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill.....	$5.25	$5 50
Milwaukee, Wis.....	5.25	5.50
Kansas City, Mo.....	8.45	8.70
Council Bluffs, Iowa.....	8.45	8.70
Lincoln, Neb.....	8.60	8.85
Sioux City, Iowa.....	8.45	8.70
Aberdeen, S. Dak.....	8.50	8.75
Dubuque, Iowa.....	6.55	6.80
Madison, Wis.....	6.75	7.00
St. Paul, Minn.....	7.75	8.00
Burlington, Iowa.....	6.75	7 00
Des Moines, Iowa.....	8.20	8.45
Davenport, Iowa.....	6.55	6.80
St. Joseph, Mo.....	8.45	8.70
Leavenworth, Kan.....	8.45	8.70
Omaha, Neb.....	8.45	8.70

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver.....	$8.00
Pueblo.....	8.00
Colorado Springs.....	8.00
Leadville.....	8.00
Cheyenne, Wyo.....	10.00
All points between Denver and Missouri River.....	8.85

According to a recent opinion rendered by Attorney-General Olney, merchandise that has been in bond for the full limit of time may be exported and brought back again as an original importation entitled to another three years in bond. This opinion traverses a recent decision of the Solicitor of the Treasury that such goods could not legally be reimported with the privileges of an original importation. In view of prospective tariff reductions, the Attorney-General's decision will have a considerable interest for the owners of some classes of goods now lying in bond which have nearly reached their limit.

The official Treasury statement places the stock of gold, gold coin and gold certificates in the United States, on June 1, at $665,000,000. Of this amount the national banks of New York State hold $85,700,000, Illinois coming next with $26,000.000 and Pennsylvania third with $20,650,000.

May's fire losses in the United States, according to the lists published by the *Journal of Commerce*, reached a total of $10,777,800, compared with $11,540,000 in the previous month and $10,427,100 in May, 1893.

CONDITION OF THE

Hardware Trade.

CAREFULLY assorted orders for small quantities of goods have characterized the trade for the past month, though the opinion is generally expressed that the volume of business for May compares favorably with the preceding months of the year. The market on Wire Nails shows considerable strength at the recent advance in price, though there is a disposition on the part of buyers to purchase only for immediate requirements in anticipation of lower prices. The unfavorable weather for the past two weeks has added to the sluggishness of trade, diminishing the demand for such seasonable goods as Lawn Mowers, Freezers, Hose, &c., while restricted building operations limit the demand for Builders' Hardware. There is, however, every reason to expect a continuance of the present volume of business, except perhaps such a falling off as may naturally be attributed to the ordinary dull summer months upon which the trade is about entering.

Advices from Chicago.—The Shelf Hardware jobbers are enjoying a somewhat better trade than had been expected after the advance in Western freight rates last week. Orders have kept up from the various parts of their territory in good shape. They are not large, but fairly numerous, and the influx is steady. Very little buying is being done for stocking up, but the demand seems to be continuous for assorting. Even the trade in seasonable goods continues along in about the same way with a regular demand for small lots, showing that the trade is being kept well in hand and that the future has not been anticipated to any extent. For this reason jobbers are inclined now to believe that trade may continue steady for another month at least. A disposition is noted in some directions to increase orders for staple goods, probably owing to the strength of raw materials, which is perceived by all who are in touch with the iron trade. Wire Cloth is firm at $1.60, with an unusual demand recently for large quantities from unexpected sources. House Furnishing Goods and Tinware are dull and are expected to continue so until workingmen are better employed. Roofing Plates are scarce and firm. Heavy Hardware jobbers have had much better trade during the past two weeks, which is largely in consequence of the closing down of so many mills, thus throwing business into jobbers' hands which usually goes to the manufacturers. This is a trade which is liable to be cut off soon by resumption of mills, but in the present uncertain condition of labor troubles may last for some weeks.

Notes on Prices.

Wire Nails—The Wire Nail market still shows an upward tendency and continues strong at the advance noted last week of $1 15 in car lots at mill. Owing to the higher price of raw material manufacturers show no disposition to shade these figures, although buyers are ordering in limited quantities to meet present requirements. Small lots from store in New York are held at $1.25 to $1.30

Advices from Chicago.—The advance in freight rates from the East on the 15th is mentioned by manufacturers as an additional element of strength in the Wire Nail market, which will fortify the position they have taken for advanced prices in consequence of dearer raw material. Some large sales have

recently been made to jobbers in the Northwest, but orders in this immediate vicinity have been comparatively small, as large stocks are still held here which are offered at prices a little below those made by manufacturers. Quotations on factory lots are still about $1.20, Chicago, but manufacturers talk of advancing this week. Small lots from stock are selling at $1.20 to $1.25, and jobbers report an increasing inquiry from the retail trade.

Cut Nails.—There is no change in the condition of the Cut Nail market, while the same conditions which prevailed last week continue to strengthen prices. Quotations remain unchanged and only a fair demand is reported. Eastern mills are quoting 95 cents to $1 for Nails delivered on dock in New York. Small lots from store are held at $1.10 to $1.15.

Chicago, by Telegraph.—Local manufacturers of Steel Cut Nails have had a good trade and report specifications coming in freely on orders they have booked. Prices on factory lots are continued at 90 to 95 cents on 55-cent average. Jobbers have had a somewhat lighter trade in Cut Nails recently, but quote prices at $1.10 to $1.15 from stock.

Barb Wire.—The demand for Barb Wire is only moderate, with no change in the condition of the market. Prices continue firm, the market being represented by the following quotations for Four-Point Galvanized, delivered at the points named: Pittsburgh, $2.05 to $2.15; Cleveland, $2.10 to $2.20; Cincinnati or Allentown, $2.15 to $2.25; Chicago or New York, $2.20 to $2.30.

Chicago, by Telegraph.—Manufacturers state that while shipments of Barb Wire are not so heavy as before the recent advance in freight rates to the West, yet they are keeping up better than had been expected. The advancing tendency in the price of Iron and Steel seems to be stimulating buyers to take in larger stocks of Barb Wire and for this reason trade continues in fair condition. Prices are very firm, in some cases an advance being asked, but for the present prices of Galvanized may be quoted at $2.30 to $2.35 in small lots, with 10 cents off for carloads.

Chain.—The Chain market continues without important change in its general features. The demand is referred to as small, but the manufacturers have avoided accumulating heavy stocks, so that the amount of Chain on hand at present is unusually light. Prices have been somewhat unsettled and lower figures are named, but there is at present a disposition to refuse to make further concessions. Jobbers have, with very few exceptions, been buying from hand to mouth and their stocks are unusually light.

Boss Instantaneous Mending Cone.—P. D. Murphy, Lockport, N. Y., is putting on the market this article. The Cones are sold to the trade at the following net prices:

One box	$0.25
One dozen boxes	2.00
Three dozen boxes	5.25
Six dozen boxes	9.00
One gross	15.00

Glass.—Little of interest has transpired during the past week in the Glass market, while the demand continues restricted. The rainy weather of the past two weeks has retarded building operations throughout the country, and has to a large extent affected the distribution of Glass. Prices, as a rule are well maintained, although under some conditions quotations have been shaded. The New York market is represented by quotations on American Window Glass of 85 per cent. discount for single and double strength Glass in car lots, and 80 and 20 per cent. discount in smaller quantities. Plate Glass is in fairly good demand, with prices firm at 70 and 5 per cent. discount.

Old Metals. — Business is quiet. Some comparatively large sales of Scrap Iron have been made during the week, but generally at prices which touched bottom figures. The following quotations represent about the dealers' prices paid in this city for Old Metals:

Heavy Copper	℔	6¾¢
Light and Tinned Copper	℔	6 ¢
Heavy Brass	℔	4⅛¢
Light Brass	℔	3⅜¢
Lead	℔	2½¢
Tea Lead	℔	2¼¢
Zinc	℔	2 ¢
No. 1 Pewter	℔	12 ¢
No. 2 Pewter	℔	6 ¢
Wrought Scrap Iron	gross ton	$7.00
Heavy Cast Scrap	gross ton	7.00
Stove Plate Scrap	gross ton	3.50
Burnt Iron	gross ton	2.50

Old Rags, Paper, &c.—The market is quiet and prices firm. The following are the current rates paid in New York for Old Rags, Paper, &c.:

No. 1 White Rags	℔	3¼	@	3⅜¢
No. 2 White Rags	℔	2	@	2¼¢
Mixed Rags	℔			¾¢
Blues and 3ds	℔	1	@	1¼¢
Hard Sized White Shavings	℔	2⅛	@	2⅜¢
No. 1 White Book Shavings	℔	1¾	@	2⅛¢
No. 2 White Book Shavings	℔	1⅛	@	1⅜¢
Light Book Shavings	℔			¾¢
No. 1 Mixed Shavings	℔	1	@	1¼¢
No. 2 Mixed Shavings	℔	¾	@	1 ¢
No. 1 Printed Books	℔	1	@	1¼¢
Ordinary Mixed Books	℔	⅛	@	¾¢
Newspapers	℔			2-5¢
No. 1 Manila Paper	℔	¾	@	1 ¢
No. 2 Manila Paper	℔	⅛	@	¾¢
Bogus Paper	℔			½¢
Common Paper	℔			⅜¢
Straw Chips	℔			½¢
Binders' Clippings	℔			½¢
Jute Butts	℔	1⅞	@	2 ¢
No. 1 Jute Bagging	℔	1	@	1¼¢
Mixed Bagging	℔	¾	@	1 ¢
No. 2 Bagging	℔	½	@	¾¢
Hemp Twine	℔	2	@	2¼¢
Manila Rope	℔	2⅛	@	2¼¢
Jute Rope	℔	1½	@	1¾¢
Mixed Rope	℔	¾	@	⅞¢

Old Rubber.—The following are about the prices for Old Rubber, delivered in New York, except where otherwise stated:

Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03½
Rubber shoes, less than carloads, ℔ lb.	@	.03¼
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

Trade Notes.

"Poison in the Pot" is the startling title of a little circular issued by Manning, Bowman & Co., 57 Beekman street, New York. The meaning of this frightening title is explained in the inner page of the circular, where it is pointed out that cheap copper Pots, nickel plated, are often dangerous vessels to use. Lead is apt to be present, and verdigris forms from the copper. At the close the merits of the white porcelain lined Agate Ware are touched upon.

The New Era Iron Works, Dayton, Ohio, issue a pretty little circular relating to the New Era Gas and Gasoline Engines of their manufacture. A general description is given of Gas Engines, and it is pointed out that they are very convenient and economical for many purposes. Particular emphasis is laid upon their desirability for electric lighting.

B. F. Perkins & Son, Holyoke, Mass., publish a neat illustrated catalogue and price-list of their manufactures. Their specialty is the Perkins Improved Ventilating and Exhaust Fan, which is made for vertical and horizontal setting; also Wall Fans, Mill Ventilators, Blower Fans, &c. They also make a Fan with high speed engine connected with it. All these Fans and Blowers are illustrated in the catalogue, and descriptive particulars tell of their important features. Their improved Fan Box is the subject of a special notice. An interesting feature of the circular is the account of their method of testing Fans. Following the notice of the Fans is a long list of testimonial letters and references. Special machines and fittings for paper makers are noted at the end of the pamphlet.

The New Era Iron Works have been incorporated at Dayton, Ohio, with a capital of $50,000, to manufacture Gas Engines and iron specialties. Their Engine, the New Era, which, we understand, has been in successful operation for nearly two years, will be built principally in the larger sizes, and especial attention given to its construction for private electric light plants.

The Excelsior Steel Furnace Company, 38 West Monroe street, Chicago, in their advertisement in this issue give an illustration on a large scale of one of their complete double Stacks. These are made 10 feet 6 inches long, with heads and nailing straps attached, ready to put in without piecing or soldering. The company manufacture and carry in stock nearly 400 different sizes and lengths of double and single Stacks.

The advertisement elsewhere of the Bolgiano Mfg. Company, 415 Water street, Baltimore. Md., will be of interest to many readers. The two specialties alluded to are the Little Giant Water Motor and the Perfection Gas Iron.

R. E. Dietz Company, 60 Laight street, New York, advise us that they are doing a very good export trade, mentioning one order for over 1800 Street Lamps for the city of Para.

The Hartman Mfg. Company of Elwood City, Pa., manufacturers of Hartman Wire specialties, have recently made shipments of Fencing to France, South America and Japan. Last week this concern prepared two shipments, aggregating 5 tons of Wire, for export to Argentine Republic, South America.

The New Castle Galvanizing & Chemical Company, Newcastle, Pa., have been chartered, with a capital stock of $10,000. The directors are A. Johnston, D. R. Jenkins and H. Copewell, all of New Castle.

For the accommodation of their patrons in the East the Geuder & Paeschke Mfg. Company of Milwaukee, Wis., have established an agency with the Central Stamping Company of New York, for the sale and distribution of their Cream City Flour Bins and Sifters in the New England, Eastern and Southeastern States. The Central Stamping Company will carry a full stock of bins and all orders intrusted to them will be promptly filled.

S. B Corby, 31 South Canal street, Chicago, Western manager for the Huyett & Smith Mfg. Company, issues a neat illustrated circular calling attention to the Smith Patent Ventilating Fan as a seasonable requirement with

the approach of the heated term. These Fans are furnished with and without electric motors.

FLASHINGS.

GEO. A. KATZ, for a number of years with Edward Kirk, Jr., has purchased W. B. White's factory, 62 and 64 Pacific avenue, Chicago, and will continue manufacturing copper and galvanized iron cornices, skylights, tin, slate and iron roofing at the same place.

THE AMERICAN ROOFING COMPANY, St. Louis and Cincinnati, report their business for the month of May as being in excess of the corresponding month of last year. With factories located in both St. Louis and Cincinnati, they are in position to take advantage of any cut in freight rates either East or West. They advise us that their June business is excellent so far as it has gone, and they look for a continued good demand during the entire month.

THE KNISELY & YELDHAM COMPANY, 68 to 74 West Monroe street, Chicago, are to do the slating, galvanized iron cornices, gutters, &c., for the new school building, South Evanston. Also the slate roofing for the new building of the Famous Mfg. Company, East Chicago, Ind.

Shop Nomenclature.

Every trade is prone to develop a distinct dialect or set of technical terms and phrases—as a rule, most appropriate to its character but likewise almost unintelligible to the outsider. The machinist can talk a language that is no clearer to the uninitiated than that of the abstruse scientist, except, perhaps, because of a certain symbolic meaning to be found in many of the technical terms. In fact, one cannot fail to be impressed with this spirit of symbolism as he hears the familiar names of parts of the human body applied to inanimate tools and machines. The character and use of the lower portion of a machine is vividly presented to the mind when it is called a leg or a foot: the terms "body," "head" and "back," mechanically applied, are immediately clear to us, while there appears at once a fitness in the "arms" of a pulley, the "hands" of a watch or the "fingers" of a clutch. "Eyes" and "ears" are certainly suggestive terms when they refer to objects with which the machinist has to do, and so we find both similarity of form and use existing between the human jaw and teeth and the "jaw" of a vise or the "teeth" of a saw. Seemingly, having exhausted the body as a source, the versatile mechanic has turned to the clothing we wear. He can show one either a "shoe" or a "cap;" will place a "button" where it will do its duty as a knob or will hold two pieces together; he will even fit a "collar" or a "sleeve" over a shaft. All this in the way of curious terms and striking resemblances, but there is withal an important side to this matter of technology, or rather technical dialect. As it is well to-day that all men of science and letters can communicate through one language, the Latin (although it be dead to the world at large), so it is desirable that, at least within the limits of our own English tongue, there should be agreement among technologists, professors and artisans as regards technical terms and their definitions. For this dialect changes with the locality. Words that are familiar to us upon this side of the Atlantic are simply unintelligible to the English mechanic, and perhaps even more generally the reverse is the case. Thus the pitman of the Englishman or of our own old millwrights becomes the connecting rod of to-day and of this country. The punching bear is almost unknown to us by name, but the term screw punch is at once suggestive and explanatory of a common tool. The tap bolt of one locality is the cap screw of another, and so on. Mechanical and technical dictionaries of course serve to clear up some of the difficulties, but nothing is truer than that the lexicographer records but does not originate the terms or their definitions. In many a shop the origin of certain accepted titles can be traced back to the facetiousness of some workman who in the spirit of humorous comparison gave a symbolic name with such fitness that moral suasion could not overcome it. In fact, things must have a name, and if not well christened they are sure to be badly nicknamed. Indeed, it is common to find an article known by one name in the office and drafting room and by another entirely different in the shop. Thus the simple and explanatory title "bed" (of an engine) was found in one case to have been turned into "bullhead" by the molders, notwithstanding that there appeared neither symbolic nor sentimental reason therefor. The draftsman is often much troubled by this action on the part of the workmen. He gives his drawing a certain title or makes an itemized list of the parts, giving to each a name, but finds subsequently that his terms and titles when expressed in shop orders are not perfectly intelligible. His titles are likely to be long, but intentionally comprehensive, nevertheless his "regenerator spring rod clamp" is likely to be christened by the workman with a name perhaps less explanatory, but assuredly simpler and shorter. In this matter there should certainly exist the spirit of co-operation. There is no use in trying to make a bird sing that won't sing, and therefore there should be such agreement upon terms and titles that no misunderstanding can possibly arise.

Waste of Natural Gas.

Only the other day, in conversation with a well-known manufacturer, says a writer in the Pittsburgh *Dispatch*, I mentioned that the system of burning gas which he employed in his work was most extravagant and wasteful. I detailed to him some of the latest improvements which had come to my notice, when he turned around in his chair and remarked: "You don't seem to understand that we have our own well. What is the use of economizing? If we don't get the gas, Mr. —— will," mentioning the name of a gentleman who had wells close by him. Here was an instance of utter disregard for economy in the use of a good thing. It is so all over the country. Why, if all the gas burned and wasted in Pittsburgh were made out of oil, the entire output of the country would not produce it. There will have to be some material changes in the methods of burning gas before manufactured fuel can take the place of natural gas and make a profit for the gas companies. Theoretically, gas making is about perfect in its process, 90 per cent. of the coal being saved, but the most troublesome and as yet unsolved problem is how to handle it. If the supply required was always uniform there would be no trouble, but as the demand might fall from several million feet in the morning to several thousand feet in the afternoon, the gas maker who would supply the general trade has a problem which is indeed difficult to solve.

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Metal and Miscellaneous Prices.

CHICAGO, JUNE 7, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and Melyn Grade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.35
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	@ $5.60
IC, 14x20, 90 ℔	@ 5.35
IC, 14x20, 100 ℔ .. 5.50	@ 5.65
10 x 20	@ 8.50
20 x 28 .. 11.30	@ 11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20. 5.75	@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—

IC. 14 x 20	@ $5.50
20 x 28	@ 11.00
IX. 20 x 28	@ 14.00

Worcester Brand and equal.—

IC, 14 x 20 .. 6.12½	@ .....
IC, 20 x 28 .. 12.25	@ .....
IX, 14 x 20 .. 7.62½	@ .....
20 x 28 .. 15.25	@ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20.	$9.25
Royal extra, IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
" IC, 20 x 28	12.50

Roofing Plates.

Palm, IC, 20 x 28	@ $11.50
Palm, IX, 20 x 28	@ 14.00
Empire, IC, 20 x 28	@ 12.00
Empire, IX, 20 x 28	@ 15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 14.75
" IX, 20 x 28	@ 17.25
Westmoreland: IC, 14 x 20	$6.00
IC, 20 x 28	12.00
Elwood: IC, 20 x 28	$11 50
Kenwood: IC, 20 x 28	$11.50
Furmston: IC, 20 x 28	$11.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process: IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	15.50
IX, 20 x 28	22.50
H. B. L., Old Style: IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₹ ℔ 2 3-10¢	3 1-10¢
17 to 20	₹ ℔ 2 4-10¢	3 2-10¢
21 to 24	₹ ℔ 2 5-10¢	3 3-10¢
25 and 26	₹ ℔ 2 6-10¢	3 4-10¢
27	₹ ℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers	13¢ net.
Patent Planished ₹ ℔ A, 10½¢; B, 9½¢	dis. 5%
Craig's Polished Sheet Steel	8½¢

Galvanized.

Juniata or first quality.....dis. 75@5%

Copper—

Ingot.

Lake	10¼¢ @ 10⅝¢
Casting Brands	9¾¢ @ 10⅛¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₹ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, 5/8 inch up to ¾ inch	.36
Plain, ½ inch up to 5/8 inch	.38
Plain, 3/8 inch up to ½ inch	.41
Plain, 5-16 inch up to 3/8 inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, 1/8 inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than 1/8 inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 ℔ casks	4.50¢
300 ℔ casks	4.70¢
Loose sheets	4.80¢

Lead—

Soft Pig Lead	4 ¢
Bar	4½¢
Pipe	5½¢, dis. 10¢
Block Tin Pipe	35¢
Sheet	6¢, dis. 10%

Solder—

½&½	13¢
Extra Wiping	11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson	12½¢
Hallett's	11½¢

Wrought-Iron Pipe—

1¼ and under, Plain	57½%
1¼ and under, Galv	50%
1½ and over, Plain	67½%
1½ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles: Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₹ ℔, 2 ¢
" " Brown	₹ ℔, 1½¢
" " Purple	₹ ℔, 2½¢
" Ground in oil, B. Red	₹ ℔, 6½¢
" Ground in oil, Red	₹ ℔, 6½¢
" Ground in oil, Brown	₹ ℔, 5½¢
" Ground in oil, Purple	₹ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	54¢
Linseed Oil, Raw, in bbls	51¢
Mineral Paints	2@4¢
Orange Mineral	9¾¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Slpe's Japan Oil, in bbls, ₹ gal	84¢
Spirits Turpeutine, in bbls., ₹ gal	36¢
Asphaltum, Trinidad Refined, ₹ ton	$45
Tarred Felt, 1 Ply, ₹ 100 ℔	$1.60
Tarred Felt, 2 Ply, ₹ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₹ roll of 108 sq. feet	$1.75
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, JUNE 8, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	₹ ℔, 65¢
100-℔ lots	₹ ℔, 63¢
Ton lots	₹ ℔, 60¢

No. 1 Alum num (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	₹ ℔, 63¢
100-℔ lots	₹ ℔, 60¢
Ton lots	₹ ℔, 55¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	₹ ℔, 60¢
100-℔ lots	₹ ℔, 55¢
Ton lots	₹ ℔, 50¢

Antimony—

Cookson	₹ ℔, 10¾¢
Hallett's	₹ ℔, 10 ¢

Brass—

Planished.....net

Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¾ in. up to 2-in	$0.35
5/8-in. up to ¾-in	.36
½-in. up to 5/8-in	.38
3/8-in. up to ½-in	.41
5-16-in. up to 3/8 in	.48
¼-in. up to 5-16-in	.65
3-16-in. up to ¼-in	1.00
1/8-in. up to 3-16-in	1.50
Smaller than 1/8-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 18, inclusive,	.28

25 @ 30%

Copper and Bronze Tubing—

8¢ ₹ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₹ ℔, net

Ingot.

Lake	10½¢
Ansonia Grade Arizona	10 ¢
Ansonia Grade Casting	9½¢
Planished	net
Sheet and Bolt	15¢ ₹ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint	list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	85%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz. 20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₹ ℔, 2.50	2.80¢
Nos. 17 to 21	₹ ℔. 2.60	2.90¢
Nos. 22 to 24	₹ ℔, 2.70	3.00¢
Nos. 25 and 26	₹ ℔. 2.80	3.10¢
No. 27	₹ ℔. 2.90	3.20¢
No. 28	₹ ℔, 3.00	3.30¢
American B. B.	₹ ℔, 4¢	@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment	₹ ℔, 11½@12½¢
Patent Planished	₹ ℔, A, 10¢; B, 9¢
Craig Polished Sheet Steel	₹ ℔ 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@75&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig	3¾¢@4¢
Bar	4½¢
Pipe	5¾¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6¾¢, 20%

Old Lead in exchange, 2¾¢ ₹ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil: Raw, ₹ gal	@ .50
Boiled	@ .53
Spirits Turpentine: In bbls	@ .30½
Putty: In barrels and ½ bbls	.01¾ @ .01¾
In tubs	.01⅞ @ .01⅞
In tin cans	.01⅞ @ .02½
In bladders	.01⅞ @ .02½
Roofing Material, &c.: Asphaltum, Trinidad Refined, ₹ ton	$30.00@$35.00
Asphaltum, Rock, ₹ ton	$14.00
Coal Tar Felt, 1 Ply, ₹ ℔	2¢
Coal Tar Felt, 2 Ply, ₹ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₹ roll 108 sq. ft.	$1.85
Roofing Pitch, ₹ bbl	$3.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₱ bbl. $1.32@$1.33
Rosin, E. & F.....₱ bbl. $1.40@$1.65
Rosin, G. & H.....₱ bbl. $1.80@$2.15
Rosin, I. & K.....₱ bbl. $2.40@$2 80
Rosin, M. & N.....₱ bbl $2.90@$3.10

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr.....$3.25@$4.50
Pen Argyle, ₱ sqr.....3.70@ 4.00
Peach Bottom, ₱ sqr.....4.75@ 5.60
No. 1 Chapman, ₱ sqr.....3.90@ 4.25
Lehigh Slates, ₱ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₱ sqr.....2.50@ 2.75
Purple, ₱ sqr.....3.50@ 4.50
Unfading Green, ₱ sqr.....3.50@ 4.00
Red, ₱ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼.....13½@14¢
No. 1.....11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₱ ℔.....3½¢
½ bbls., about 300 ℔, ₱ ℔.....4¢
Kegs, about 110 ℔, ₱ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔.....4¢
5 % dis.

Yager's Soldering Salts.
¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔.....21½¢@22¢
Straits, pigs, ₱ ℔.....21¢@21¼¢
Straits in bars, ₱ ℔.....22¢@22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX. 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20..... 5.50
Columbia, IC, 14 x 20..... 7.00
Dane, IC, 14 x 20..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28.....15.00
Empire, IC, 14 x 20..... 5.75
Extra Central, IC, 14 x 20.....5.62½
Flag, IC, 14 x 20..... 5.25
Fort Pitt, IC, x 20..... 5.75
Freeport (Hand dipped and Resquared). IC, 14 x 20..... 7.50
IX, 14 x 20..... 8.75
Globe, IC, 14 20 x 28.....11.00
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resqnared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Roofing (Resqnared), IC, 14 x 20..... 8.25
McKinley, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Newcastle Real Old Method, IC, 14x20. 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palacio, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Scott's Extra Coated (Resqnared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resqnared), IX, 14 x 20.....10.75
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.00
" IX " 14 x 20.... 7.25
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20..... 5.37½
Vigilant, IC, 14 x 20..... 5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20..... 6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.50
Florence, IC, 14x20..... 6.75
Hazel, IC, 14x20..... 5.80
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20..... 11.00
Merion, IC, 14x20..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Juniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20..... 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.25
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20..... 7.25
Versailles, IC, 14 x 20..... 5.75
Youghlogheny, IC, 14 x 20..... 6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$7.50
20 x 28..... 15.00
IX, 14 x 20..... 8.75
20 x 28..... 17 50
Pontymister Grade, IC, 14 x 20..... 6 50
20 x 28.....13.00
IX, 14 x 20..... 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20.....$5.75
20 x 28.....11.50
IX, 14 x 20..... 6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20..... 5.40
20 x 28.....10.80
IX, 14 x 20..... 6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10.50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.

Melyn and Calland Grade.	IC, 10 x 14	$6.35
" "	IC, 12 x 12	6.60
" "	IC, 14 x 20	6.35
" "	IC, 20 x 28	12.70
" "	IX, 10 x 14	8.00
" "	IX, 12 x 12	8.25
" "	IX, 14 x 20	8.00
" "	IX, 20 x 28	17.00
" "	DC, 12½ x 17	6.00
" "	DX, 12½ x 17	8.00
Allaway Grade.	IC, 10 x 14	5.75
" "	IC, 12 x 12	5.85
" "	IC, 14 x 20	5.75
" "	IC, 20 x 28	11.50
" "	IX, 10 x 14	7.00
" "	IX, 12 x 12	7.25
" "	IX, 14 x 20	7.00
" "	IX, 20 x 28	14.00
"	DC, 12½ x 17	5.50
"	" DX, 12½ x 17	6.50

Coke.

Steel Coke.—IC, 10x14, 14x20..... 5.35
10x20..... 8.25
20x28.....11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates—

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List..... 25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₱ doz..... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv..... ..50&10&5%
1½ and over, Plain .....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 18.2..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks..... ₱ ℔ 5½¢
Per ℔.....6¢

MANUFACTURING.

Hardware.

Charles E. Hunter, an implement dealer, Richmond, Va., is the patentee of the Farmer's Friend plow, which is well known in the Southern States. Mr. Hunter resided in New York prior to 1865, but in that year he went South and settled in Fredericksburg, Va., where he engaged in the manufacture of plows and castings. Mr. Hunter is also connected with the Petersburg Iron Works.

The strike in the bronzing and buffing department of the Russell & Erwin Mfg. Company, New Britain, Conn., has been settled and most of the strikers have returned to work. The men struck for a return of half the reduction in wages which was made some time ago. The officers of the company, however, refused absolutely to accede to their demands, with the above result.

The John Russell Cutlery Company, Turner's Falls, Mass, closed down their works June 2 for the annual inventory and repairs.

The Yale & Towne Mfg. Company, Stamford, Conn., are contemplating an important change in their crane department, and while no definite arrangements have yet been made the company have decided to transfer their crane business to another location. The company are said to have been the first to undertake the manufacture of cranes as a specialty in this country, and notwithstanding the disadvantages of Stamford as a location for the manufacture of heavy machine work the business has grown and flourished, owing mainly to the excellence of the product. The immediate cause of the proposed action, however, is that the hardware business of the company is steadily growing and requires more room for its accommodation, while under usual trade conditions the buildings now occupied by the crane department are inadequate to its needs. These latter buildings are so located relatively to those already devoted to the manufacture of hardware as to make it desirable to utilize them for the contemplated development of the business of the hardware department rather than to erect additional buildings at a greater distance from the latter. Under these circumstances the company have decided that they will promote the interests of all departments by transferring the crane business to another and more favorable location. Overtures have been made by the company to parties in Pittsburgh and Cleveland looking to a transfer of the crane plant to either of these points, its location at which would conduce to great economy, both in the matter of production and transportation, in view of the fact that their supplies of heavy material are obtained chiefly from the vicinity of Pittsburgh, while their product is marketed principally in the great centers of the iron and steel industries, most of which are west of the Alleghanies. In order to further utilize the present plant for the development of their oldest and most important lines—namely, locks and hardware—the company have also decided on the manufacture elsewhere of the wood work required in connection with their post office equipments, the manufacture of which has heretofore occupied the whole of a large and valuable building.

Brooke, Mack & Peace are now manufacturing a line of saws, including circular, milling, band, concave, grooving, resaw, veneer and segment saws, at 479 Keap street, Brooklyn, N. Y. They are all practical men, holding positions from superintendent down with Harvey W. Peace Company until that establishment was consolidated with the National Saw Company. The new firm manufacture all kinds of circular saws for cutting wood and metal, a specialty being made of segment saws for cutting veneers. They also make molding knives for cutting wood moldings, and band saws from ⅛ to 3 inches in width. Repairing and grinding all kinds of knives is also done.

R. E. Dietz Company, 60 Laight street, New York, advise us that they are doing a very good export trade, mentioning one order for over 1800 street lamps for the city of Para.

The Hartman Mfg. Company of Ellwood City, Pa., manufacturers of Hartman wire specialties, have recently made shipments of fencing to France, South America and Japan. Last week this concern prepared two shipments, aggregating 5 tons of wire, for export to Argentine Republic, South America.

The Cable Lock & Novelty Company of Pittsburgh have been chartered with a capital of $1000. The directors are A. L. Sailor, Swissvale; Sydney T. Murphy, Osborn, and Ewing B. Kimberly, Pittsburgh.

Baker Chain & Wagon Iron Mfg. Company, Allegheny, Pa., announce that the prevailing scarcity in the supply of coal does not affect the product of their factory in any department, as they use natural gas exclusively and can fill orders promptly.

The Pope Mfg. Company at a meeting of the directors held May 25 decided to remove their general offices from Boston to Hartford, Conn., where the plant is located, in the early autumn. The change will be made as soon as the building for the offices is completed. The removal of the offices to Hartford means the removal to that city of about 100 officers and clerks and their families. The new building will cost in the neighborhood of $50,000. The building will be of exceptionally handsome design, rectangular in shape, 54 x 104 feet, three stories in hight, with a well lighted basement, which will be asphalted and made thoroughly dry so as to be used for the storage of records, &c. All the partitions in the building will be either of brick or steel lathing, fastened to light channel iron and the whole imbedded in adament or Windsor cement, making a solid fire proof partition but 1½ inches thick. The building will be heated and ventilated by a combination of the blower and direct radiation systems.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

SALESMEN selling other goods, to sell stoves on commission, in the States of Michigan, Illinois and Iowa; a liberal commission will be paid to the proper men. DeHaven & Co., Limited, Pittsburgh, Pa. June 9

Middle aged man, experienced and competent to take charge of plumbing, steam and hot water heating and gas fitting business; must be of good habits, able to plan and lay out work, handle men and estimate accurately from plans. Address by letter, giving age, experience, reference, &c., "X. Y. Z.," care of John Williams, 556 West Twenty-seventh street, New York City. June 9

TRAVELING SALESMEN or experienced canvassers; please state territory wanted; a large commission to handle the adjustable Twin spring bed; sells nicely as a side line in any part of the United States or Canada. Apply to the Rutherford Mfg. Company, Gouverneur, N. Y. June 9

A competent FURNACEMAN with some capital and business ability to handle and place hot air furnaces in New York and vicinity; manufacturer will give shop room and assistance in securing work; an excellent opportunity for the right man to establish himself in business at a small cost. "Hot Air No. 69," office of *The Metal Worker*, 96-102 Reade street, New York City. June 9

BRASS FINISHER; a man thoroughly acquainted with high class brass finishing, such as fire place frames, fire sets, andirons, &c.; state lowest salary and full particulars. "Brass Finisher," office of *The Metal Worker*, 96-102 Reade street, New York City. June 2

PLUMBER and HOT WATER FITTER; steady job to first-class man. Thompson & Morrison, Amherst, N. S. June 2

A TINNER at once, for roofing, spouting, iron ware and general work in a town of 4000 inhabitants; man who is single and has had from six to ten years' experience. Lock Box 241, Garrett, Ind. June 2

A first-class man who thoroughly understands CORNICE, BAY WINDOW and SKYLIGHT WORK and TIN ROOFING; steady job to sober and reliable party; address in writing only with references; state salary expected. "T. W. D.," 1004 Garden street, Hoboken, N. J. June 2

SITUATIONS WANTED.

By a good all around German-American TINNER, 27 years of age and married; understands the trade in all its branches; can clerk in store when wanted; Chicago or vicinity preferred. "F. S.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. June 9

To travel in Missouri, Illinois or Indiana, by competent stove, range, hollow ware and tinware SALESMAN; 12 years' experience; temperate; best of references. J. B. Smith, Room 16 Masonic Temple, Indianapolis, Ind. June 9

By a practical and experienced SLATE ROOFER, a situation for the season. B. F. Smith, 30 Rutger street, Springfield, Ohio. June 9

By a thoroughly competent man; all around MECHANIC; 15 years' experience as high and low pressure steam and hot water fitter, also heating with exhaust from engine and hydraulic work; position desired anywhere in the United States; able to take full charge of shop and outside work; best of references. W. K. Farrand, 205 Gates avenue, Brooklyn, N. Y. June 9

In a first-class shop, by a strictly first-class PLUMBER and STEAM FITTER of 24 years' experience; can furnish the highest reference. E. D. Stockton, 204 Crew street, Atlanta, Ga. June 9

By a thoroughly practical TINNER, RETINNER and GALVANIZER of gray cast, malleable, wrought and tin plate stamped ware; tinning gray iron casting with a smooth, silvery, brilliant coating by the grease finishing process; sober and reliable. Wm. Davis, 1911 Broadway, Brooklyn, N. Y. June 9

By a first class STEAM and GAS FITTER of 15 years' experience; would like a job in the South; best references furnished. W. R. Stockton, 204 Crew street, Atlanta, Ga. June 9

By a first-class PLUMBER and GAS FITTER, understanding steam fitting and roofing. Peter Keating, 72 East Tenth street, New York City. June 9

By a practical TIN and SHEET IRON WORKER, single man, who has learned his trade in Germany; three years' experience in this country; steady position desired; city or country; state wages. Louis Krentzman, 345 East Sixty-fifth street, New York City. June 9

By a TINNER with 11 years' experience at his trade; also a first-class man at furnace and hot air work; four years' experience in the tin and hardware business for himself; 26 years of age; married; references; wages moderate; steady work desired. H. S. Andrus, 19 West Arch street, Shamokin, Pa. June 9

By a PLUMBER and GAS FITTER; good at steam fitting, tin roofing, new work or jobbing. Benj. Grimes, 46 Clinton Place, New York City. June 9

As TINSMITH; can do job plumbing and wait on store; best of references as to character and ability. "H. J. D.," 186 Ohio avenue, Providence, R. I. June 9

As TRAVELING SALESMAN for a stove foundry in Eastern Pennsylvania, by a young married man, 32 years of age; understands bookkeeping; ten years' experience with present employers. "Salesman," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. June 9

By a TIN and SHEET IRON WORKER; 12 years' experience; understands all outside work, gutters, roofing, furnace, stove, range and fire place heater work and general jobbing; city or country. L. Saltman, 223 Fairmount avenue, Philadelphia, Pa. June 9

A position as TRAVELING SALESMAN; eight years' experience in general hardware as such; 29 years of age and single. "N. C.," 89 Pierpont street, Brooklyn, N. Y. June 9

By competant energetic man, as SALESMAN for stoves, ranges, furnaces or machinery in New York City, Brooklyn and Northern New Jersey; capable of figuring on contracts, directing work, &c.; moderate salary. "Salesman" No. 69, office of *The Metal Worker*, 96-102 Reade street, New York City. June 9

By a first-class PLUMBER; city or country. Chas. Baumbach, 419 West Thirty-sixth street, New York City. June 9

As TINNER or CLERK in hardware store; ten years' experience in store and shop; good workman on inside and outside work, also good salesman; strictly sober. Call Box 524, Louisiana, Mo. June 9

By July 1 by thoroughly experienced GALVANIZER and TINNER; competent to put in works; reference given. "R. C. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. June 9

By a first-class PLUMBER; city or country. James Donahue, 241 East Seventy-sixth street, New York City. June 9

By a first-class TINSMITH, ROOFER and GENERAL JOBBER; best of references. John Klein, 616 Fulton street, Elizabeth, N. J. June 9

An A1 MACHINIST, 26 years of age, expert on lathe, desires a permanent position; German; married. Chas. Bertranz, Carlstadt, N. J. June 9

By a young man who has a thorough practical knowledge of furnace and range business. H. A. Landrau, 321 East Eighty-fifth street, New York City.

A1 TRAVELER seeks road engagement to introduce and put on the market specialties in the tin, copper, stove, range or furnace line; well acquainted on the road from Maine to Nebraska; have worked the trade for the past 15 years with A1 result; open for engagement at present. "J. P. B.," 26 John street, Lockport, N. Y. June 9

By a man of experience in manufacturing stoves, specially effective in managing sales, accounting, correspondence and furnace heating; particulars and ample reference furnished; no capital except push and common sense. "S. E. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. June 9

At PLUMBING, STEAM and HOT WATER FITTING; understands working on tinware, the work generally done in a country shop; seven years' experience; 23 years of age; strictly temperate and steady, "S.," Box 82, Lakeport, N. H. June 9

As SUPERINTENDENT or FOREMAN and CUTTER in cornice and sheet metal work, by a man 40 years of age; always sober and industrious; experience of 20 years in the cornice business estimating and cutting. "Mac," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. June 9

By first-class TINSMITH, ROOFER and FURNACEMAN; city or country. Sam Teichmen, 196 Rivington street, New York City. June 9

By the year, by a TINSMITH of five years' experience, at inside and outside work. Robt. C. Clifford, Potsdam, N. Y. June 9

TINSMITH capable of taking charge of a shop, a master of the trade—can do pipe fitting, pump work and all work that comes to a country shop; satisfactory reference; New York or New England preferred. "J. D. F.," office of *The Metal Worker*, 96-102 Reade street, New York City. June 2

By a strictly moral young man where he can finish learning the tinners' trade; one year's experience; best of references; have also had experience in clerking. "H. K.," P. O. Box 366, Delavan, Wis. June 2

By a PLUMBER, ten years' experience. Arthur Wickers, 1466 Third avenue, New York City. June 2

By a first-class PLUMBER. N. Charbunneau, 1609 First avenue, New York City. June 2

As FOREMAN or SUPERINTENDENT in a cornice and roofing shop; a first-class cutter and draftsman; also understands estimating on all kinds of cornice, tin and sheet iron work; have 20 years' experience; can give best of references. "Cutter," No. 62, office of *The Metal Worker*, 96-102 Reade street, New York City. June 2

By a PLUMBER; five years' experience. Andrew Miller, 113 North College street, Schenectady, N. Y. June 2

By a first-class MECHANIC; ten years' experience at furnace work; roofing, cornice and general outside work; also gas and steam fitting and pump work; some knowledge of plumbing; experienced in the manufacture of all kind sof pieced tinware; steady, sober, honest and trustworthy; best of references; will go to any part of the United States; wages moderate; steady work desired. Geo. H. Stewart, Brownsville, Tenn. June 2

By a STEAM and HOT WATER FITTER; 12 years' practical experience; two years and a half on the absorption system of refrigerating; sober and industrious; first-class references. E. J. Taylor, 184 Franklin street, Brooklyn, N. Y. June 2

As FOREMAN, by a japanner on plain and ornamental work; first-class references; wages, $21 a week; would like to make a contract for one year. "Japanner," office of *The Metal Worker*, 96-102 Reade street, New York City. June 2

As FOREMAN in an iron foundry; five years' experience; best of references. John Lyons, 745 River street, Troy, N. Y. June 2

By an all around TIN and SHEET IRON WORKER, with some experience in piping and plumbing; city or country; good references. C. E. Campbell, Haddonfield, N. J. June 2

As NICKEL PLATER in first-class establishment, by first-class workman, either brass or iron; an all round workman; can fit up and repair machinery; also polisher and buffer. Thos. A. Anderson, 61 Elm street, Cortland, N. Y. June 2

A first-class PLUMBER, in country; 15 years' experience in New York City. James McDermott, 1089 First avenue, New York City. June 2

TRAVELING SALESMAN having trade in house furnishing goods, &c., in all States east of Kansas, desires position for months July, August and September; best references. E. W. Joyce, 169 William street, New York city. June 2

Two first-class PLUMBERS, A No. 1 men, desire to leave the city and can furnish best city reference; can do steam and gas fitting A. Gillispie, 135 West 101st street, New York, City. May 26

Steady position desired by a young man, 25 years of age, who has had five years' experience as a first-class iron stove pattern filer; steady, sober workman. Frank Hamburger, 958 Jefferson street, Buffalo, N. Y. May 26

By a good TINSMITH who understands plumbing, gas fitting, roofing and all inside and outside work; country preferred. H. Rose, care L. Bloom, 180 West Main street, Norwich, Conn. May 26

By a reliable young man as PLUMBER or ASSISTANT; recently graduated from the New York Trade School; can furnish the best of reference from former employers; also understands lead burning. "B. C. B.," Greene, Chenango Co., N. Y. May 26

First-class PLUMBER wants position anywhere; 12 years' experience. Jo. Rielly, 504 West Twenty-eighth street, New York City. May 26

By a TIN and SHEET IRON WORKER; 15 years' experience. S. Bissick, 119 Suffolk street, New York City. May 26

CORNICE, SKYLIGHTS and ROOFING; a young man having had three years' experience in the office of a large concern in New York City, also superintending outside work, desires permanent position in similar capacity; competent to keep books; position acceptable either in New York City or out of town; references and security at your disposal. "Advertiser," 172 Seventh avenue, New York City. May 2

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office of *The Metal Worker*, 59 Dearborn street, Chicago.

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AND

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"Am especially interested in the article on 'A1 Houses (wholesale),' and consider it the perfection of elaboration and detail. Even after an experience of nearly thirty-one years with this firm as manager, I find a great deal of valuable information in this article. The price of your book is a mere song when compared with its great value in material."—CHARLES E. BRADY, manager of entry rooms and private accountant for E. S. Jaffray & Co., importers of dry goods, New York City.

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Dangerous Cold Lacquers.

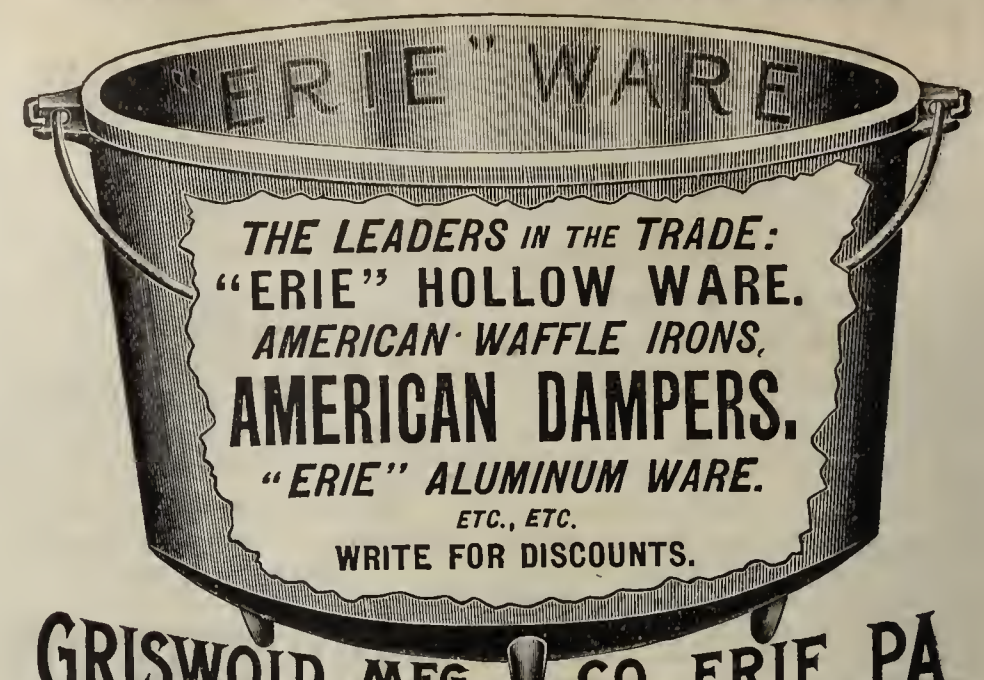
The New England Bureau of United Inspection, says the *Journal of Commerce*, has caused to be analyzed various cold lacquers recently introduced into metal working risks. The serious nature of this new hazard is indicated, first, by the large proportion of naphtha in each, whose odor is skillfully disguised by "the addition of a small quantity of amyl acetate," and, second, by the alarmingly low flash point. Comparing this last feature with kerosene oil illegally sold at a flash point under 110 degrees, and more generally of 150 degrees test, underwriters see the necessity of the using and keeping of these lacquers outside of the plant.

The chemists who analyzed the samples of lacquers made a report in which they state the flashing point in the respective samples to have been as follows: 75, 75, 47, 34, 44, 32, 62, 36, 50, 36 degrees. The chemists say the flash points are mostly below the ordinary temperature of the air, which means that sufficient vapor is given off at ordinary temperature to form an explosive mixture when combined with air in proper proportion.

The diffusion of such a vapor through an apartment which could by any means communicate with a fire or spark would constitute a very grave danger, unless means were devised to make the ratio of air to vapor so great as to prevent the formation of an explosive mixture. Lacquers up to a comparatively recent period have been simple solutions of gums in alcohol. These mixtures under consideration consist of alcohol and naphtha made to combine by amyl alcohol, a substance soluble to both, while the odor of naphtha is completely masked by the addition of a small quantity of amyl acetate, a device recently adopted for this purpose.

Foretelling Weather from Gaslights.

W. Elliott, a Scotchman, says an exchange, is the authority for the statement that weather forecasts can be made by closely observing the various shapes and shades of the gas flame as visible in a street lamp about 100 yards off. If snow is to be looked for, the gas burns with a clean, bright light, with a center as brilliant as silver, and the approach of frost is indicated by a "tail" from the bottom of the light "resembling a wine bottle turned upside down." The size of the "tail" will show the degree of frost. The forecast for sunshine is also a "tail," but with a decided difference. "The 'frost tail' is solid, but for sunshine it is made of rays closely pressed together. There is a very particular point to be observed here. The moment a 'ray tail' is seen a similar 'tail' is to be observed at certain stars, and it is not to be seen if there is to be no sunshine next day." Rays out from the sides and bottom of the light, with a flame of the same shade as a candle flame, foretell rain, and the size of the rays will be an approximate indication of the quantity of rain to be looked for. If haze and fog are to be expected., the flame burns white, and a very small flame, but bright as silver, with the slightest touch of a mauve tone, is a sure forerunner of thunder. A "reflection" around the light means wind, and a "hazy fur" is the prognostic for heat. The injunction that the light must be about 100 yards distant from the observer is especially emphasized. Those who still have street gas lamps with them will doubtless be interested in testing Mr. Elliott's system. From the vagaries of the electric light very close deductions may sometimes be drawn as to what is going on at the central station, and there is no reason why the humble gas flame should not have its own lines of suggestiveness.

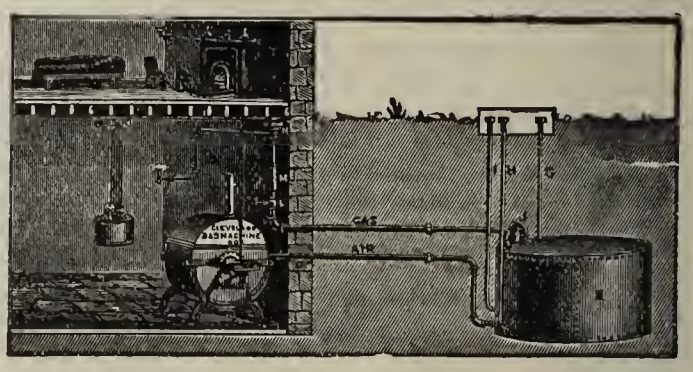


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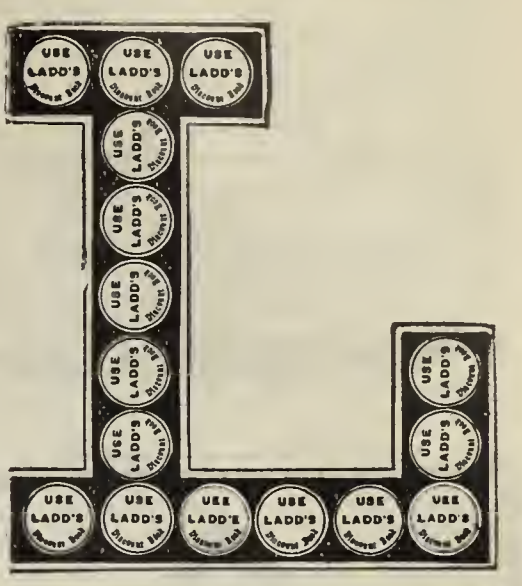
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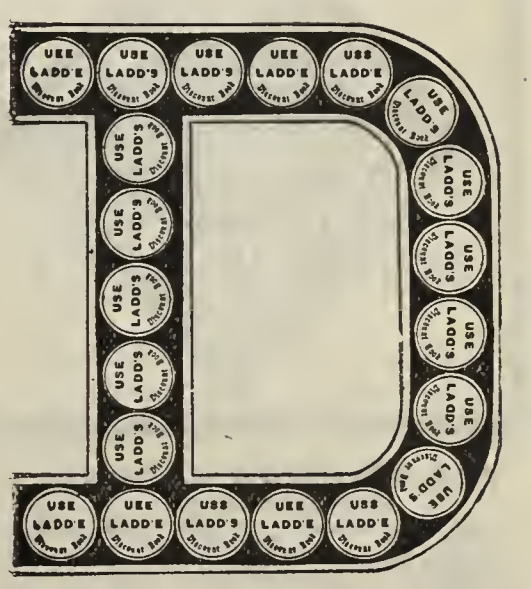
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"	98,	8 "	7.75
"	110,	10 "	12.50
"	114,	14 "	16.75

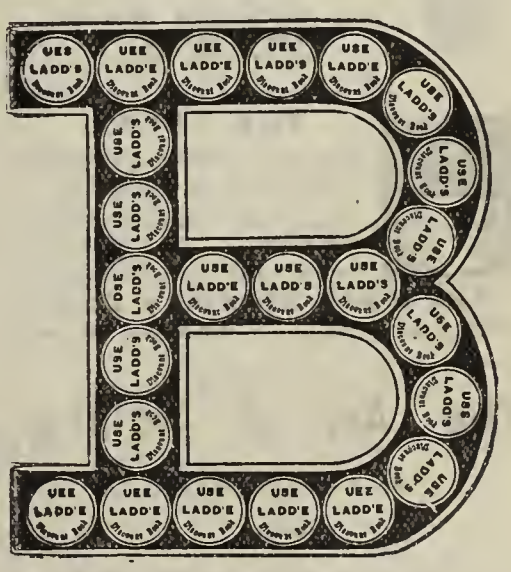
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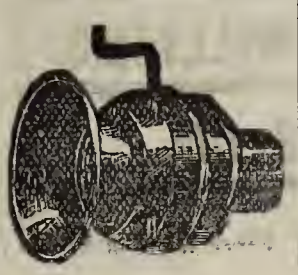
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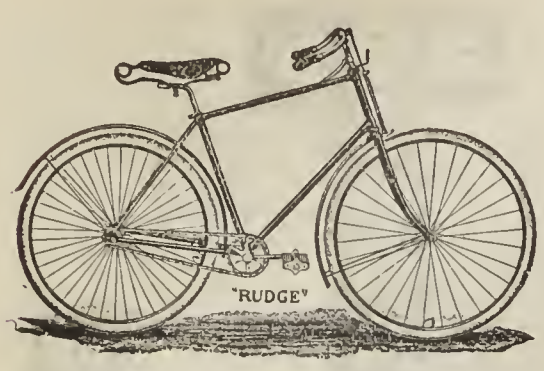
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Will run your Sewing Machine, Fans and other Light Machinery.

A Week's Work Done in a Day

No Plumbing Required.



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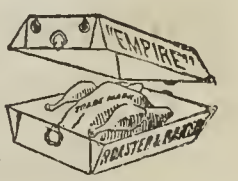
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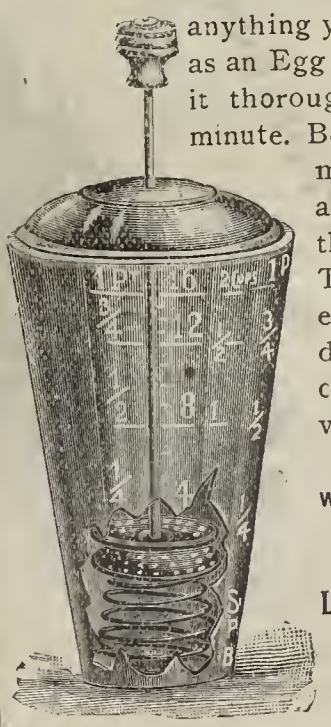
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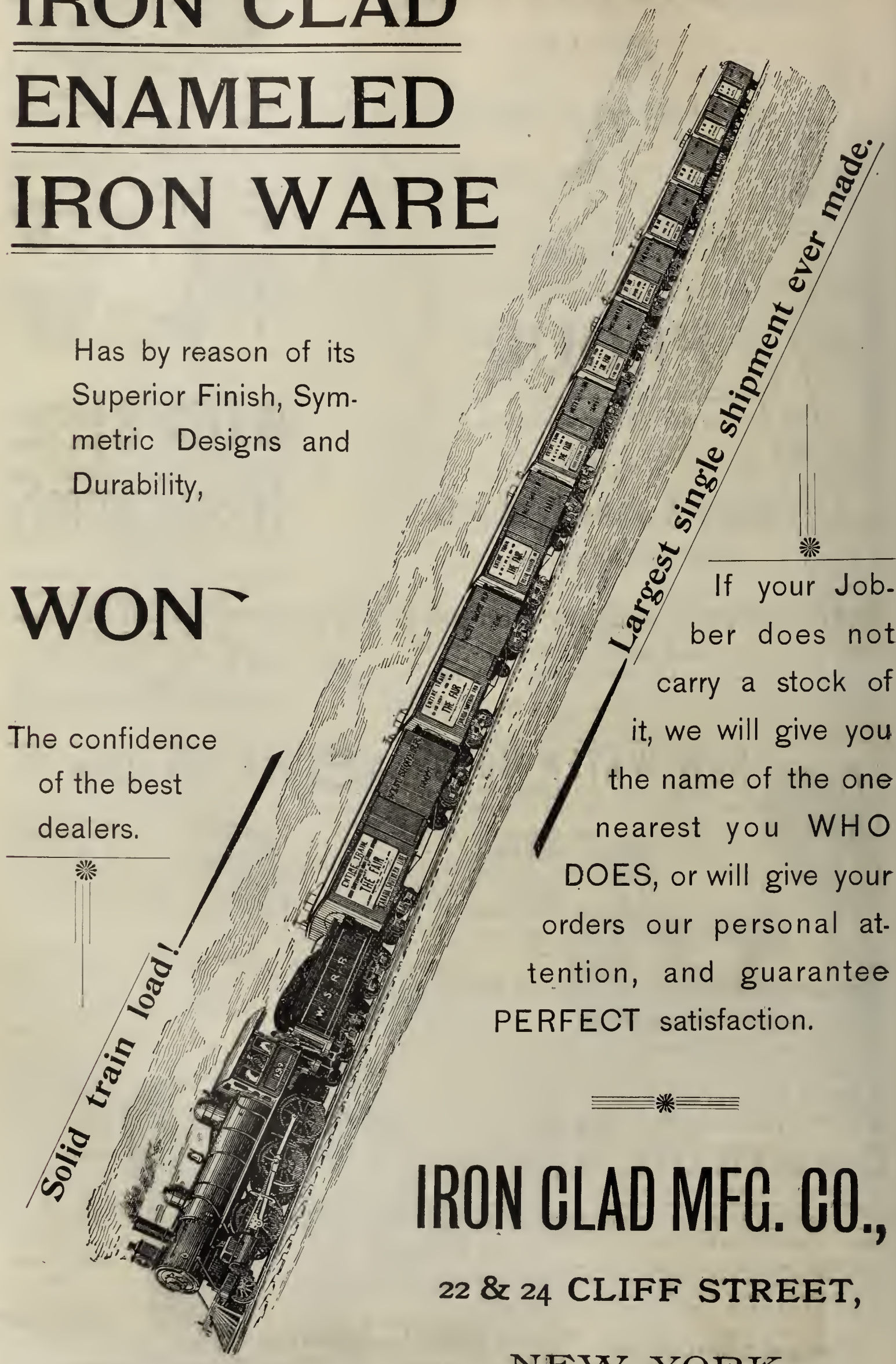
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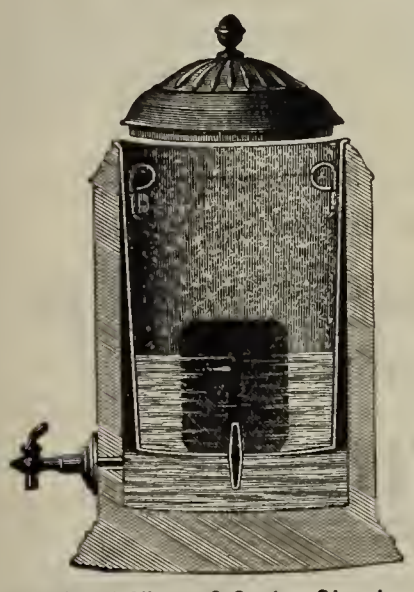
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Filter Cylinders Only, Fitted with Carbons.

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And other Spring and Summer Goods.



KEEN & HAGERTY, Baltimore,

Manufacturers Stamped, Japanned and Plain Pieced Tinware.

Merely Preliminary.

A man came down Franklin street last evening carrying a satchel, says the *Buffalo Express*. A young fellow who stood on the corner of Niagara street stepped forward and said: "Say, boss, have you got any old clothes to sell?"

"No," replied the man.

"Want your satchel carried?"

"No."

"I'll shine your shoes for 5 cents."

"Don't want a shine."

"Want to buy a paper?"

"No."

The young man looked with well simulated surprise at the man carrying the satchel and said: "Well, I can clean carpets or pack furniture."

"Haven't got any carpets to clean or furniture to pack."

"Want your lawn mowed?"

"Now, see here," said the man who was carrying the satchel, turning fiercely on the young man who had stood on the corner, "what in blazes are you following me along like this for? Quit it or I'll call a policeman."

"Well," replied the young man, "I was only trying to impress on you the fact that I am willing to work before I asked you for a few cents to get a night's lodging."

He got a quarter.

— EASY FARMING.—The man with the ginger beard was watching his neighbor laboriously digging post holes.

"They didn't dig 'em that way out in Colorado where I lived," said he.

The neighbor, who was a hired man, dropped his patent digger, looked around to see if his employer was visible, found he was not, and took a seat on the ground, ready to listen. "How did you work it?" he asked. "By steam?"

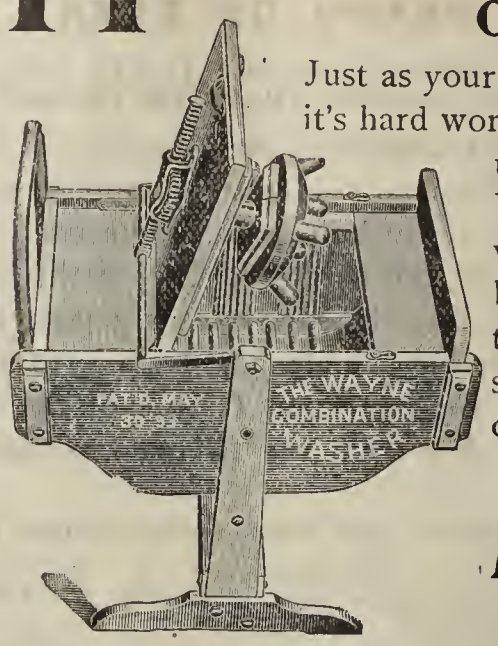
"Steam?" said the man with the ginger beard. "Naw. Done it by lightning."

"Lightning?"

"Yas. You see, in the part of the State I was in they is no metals of any kind in the ground and no trees. I've often watched the lightning cavortin' around in the heavens fer a hour at a time, jist achin' fer somethin' to strike at; but not bein' able to do so, 'cause they wasn't nothin' it could take a start at—no attraction, you see. Well, one day I was a-sweatin' away, just like you would be if the boss was around now, when a old feller, that lived there before I come, come along and says he'd show me a scheme to save all that work. You can bet I was willin', so he sends me to the house fer a bag o' ten-penny nails, and he plants a nail in every place I had marked fer a hole. 'They's a storm comin',' says he, 'and if I ain't mistakened she is a-goin' to do the job in one whirl.' I didn't say nothin', fer, honest, I thought he wuz crazy, an' I 'lowed I'd better humor him. After he got the nails all planted he dragged me away to a safe distance an' told me to watch her work. Pretty soon the storm come along, with more thunder an' lightnin' in it than you will see here in a month o' Sundays. Dreckly it got over them nails. Then—biff! blam! It went to pluggin' away at them there nails stuck in the ground, the most delighted lightnin' you ever see to git somethin' to shoot at. And ev'y time she hit there was the neatest post hole dug out you ever see. I did haf to trim a few of 'em up with a spade, but, as a gineral thing, they was neat as a body would want to look at. Natur is mighty useful if you know to handle her."

The hired man said "Gosh!" and resumed work in the automatic manner of one in a dream.—*Indianapolis Journal.*

Hard Work or Easy Work,



Just as your customer chooses. If she finds it's hard work washing, it's because she hasn't used the Wayne Combination Washer; she'd rather waste time with the old-fashioned hand rubbing way. Now, suppose you tell her about our machine; it's a sale for you and money in both of our pockets. What say you?

For Prices and Discounts write

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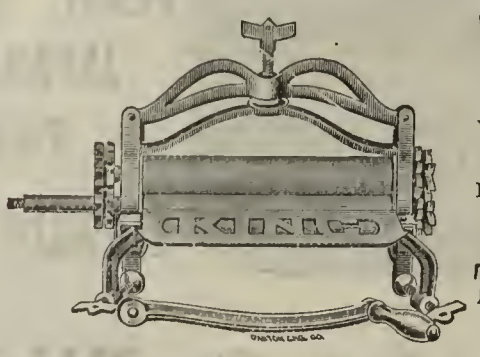
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NOTICE. Dealers should not confound this with the many cheap so-called washers, which in their time, probably, no doubt did serve their purpose. **THE BOSS** is strictly new in every sense of the word and the results from its use are a surprise to every one. We distribute a pamphlet telling all about it, free. Send for a copy and be alive to the requirements of your lady customers.

Tinned Nails and Red Cypress Wood ONLY used.

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We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

Write for Catalogue.

The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.

Covert Pants Stretcher.



Before. After.

THE Covert "Pants Streteher" will restore the pantaloons to their original shape and length.

It removes all **WRINKLES and BAGGING AT THE KNEES,** giving them the appearance of having just left the tailor's hands.

It also holds the pants in a convenient position for brushing and cleaning.

The Streteher cannot get out of order, and can be adjusted in the pants in a few seconds.

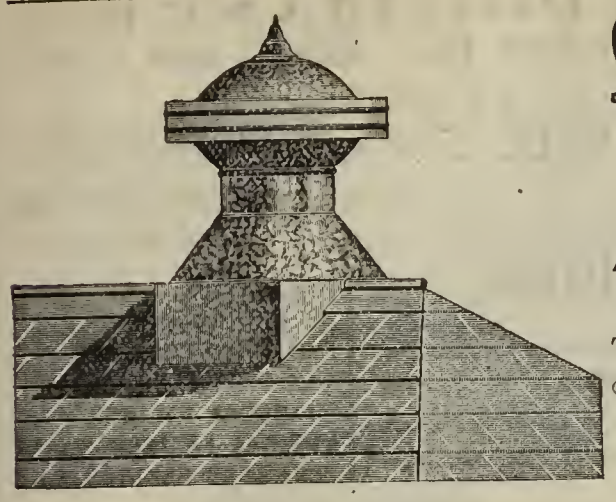
It being applied inside the pants, it obviates all objections prominent in other stretchers.

It is made of steel wire, and being in sections can be packed in a valise when traveling. Sold by the trade, or

Sample pair sent by mail to any address, free of postage, on receipt of $1.00.

MANUFACTURED ONLY BY

COVERT MFG. CO., West Troy, N. Y.



COME OFF THE ROOF

May be a slang expression, but it doesn't apply to

Globe Ventilators.

They "get there" and "stay there"

Through sunshine and through storm, doing the work required of them silently, steadily, satisfactorily.

Send for Special Pamphlet on Ventilation.

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Our repairs are sure to fit, as they are all made from manufacturers original patterns

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STOVE REPAIRS.

219 Locust St., St. Louis.

A. G. BRAUER.

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THERE RUTLAND LINING WHY

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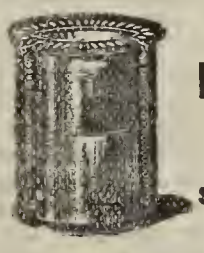
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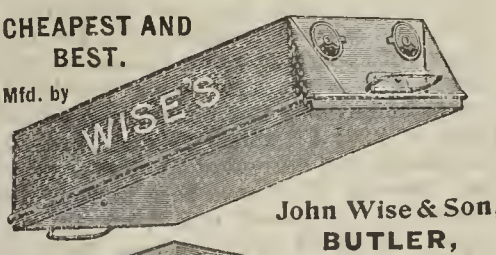
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The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

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Science in Manufacture.

Science is supreme in American production, and the Americans have outrun us all in its application, says the Edinburgh *Review*. They were the first to utilize electricity, not merely in the development of telegraphy and the kindred arts, but as a powerful ally in manufacture. In the welding of metals, for instance, it now plays an important part.

In iron and steel, the use of highly developed machinery, which is no more than the application of science, has revolutionized production. The new drop hammer has brought down the price of American plows to less than $5, and in the making of all sorts of agricultural implements it is calculated that 600 men can now produce as much as 2145 a few years ago. Where a single workman could make three dozen pairs of sleeve links in a day, a boy can now make 9000.

The manufacture of pins still holds its own as an "object lesson," but whereas Adam Smith notes with astonishment and admiration ten men turning out 48,000 pins a day, the modern American manufacturer finds no difficulty in supplying 7,500,000 in the same time as the result of the labor of five pairs of hands.

Electric Cooking Abroad.

The rustic population of the little Buckinghamshire village of Great Missenden are, says *Invention* of London, being mystified and gratified by the wonders of an electric cooking system. One of the stoves is, we learn, manufactured by the well-known firm of electrical engineers, Crompton & Co. of London and Chelmsford, and which is now being very successfully worked in this village. The patentee is an American—Carpenter by name—for whom Messrs Crompton & Co. are sole licensees in England. Early experimenters in this branch of electrical engineering employed sheets of asbestos as sheaths for the wires beneath the steel plates to hold the cooking utensils. But Carpenter's patent consists of applying enamel underneath the steel plate, containing the wires imbedded in it, the coefficient of expansion being the same in the enamel and wires. An easily regulated current of 100 volts is sufficient to produce a heat of 280° F., and this can then be maintained by a current of 50 volts or even less. Several trials have been thoroughly satisfactory, and every one is, we are informed, delighted with the ease, rapidity and thoroughness of the cooking.

— HARDWARE.—Son: "What is a deceiver?"

Father (who is a little deaf): "A man, my boy, appointed by the courts to hold out promises to the creditors."

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Positively the best. Suitable for any size lemon.

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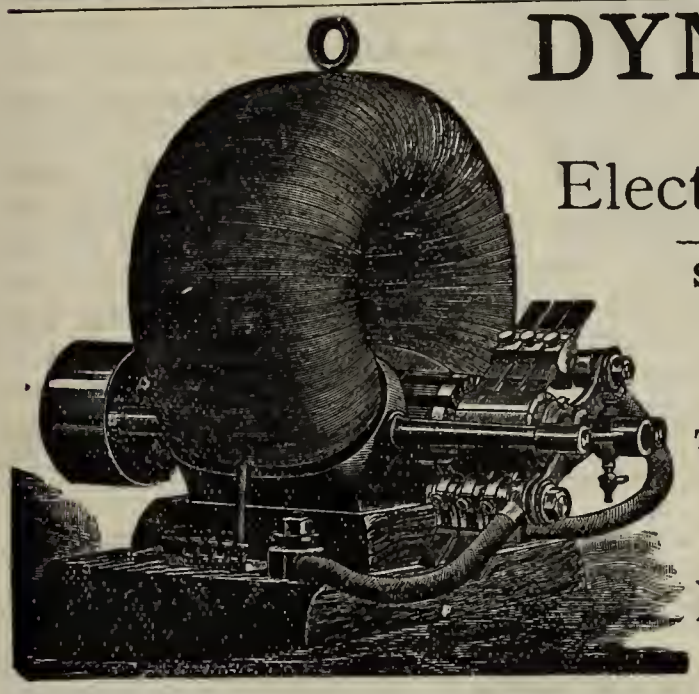
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Satisfaction Guaranteed.

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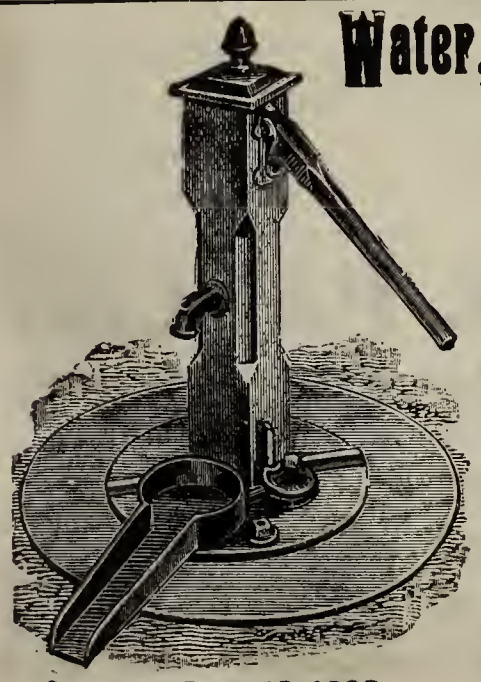
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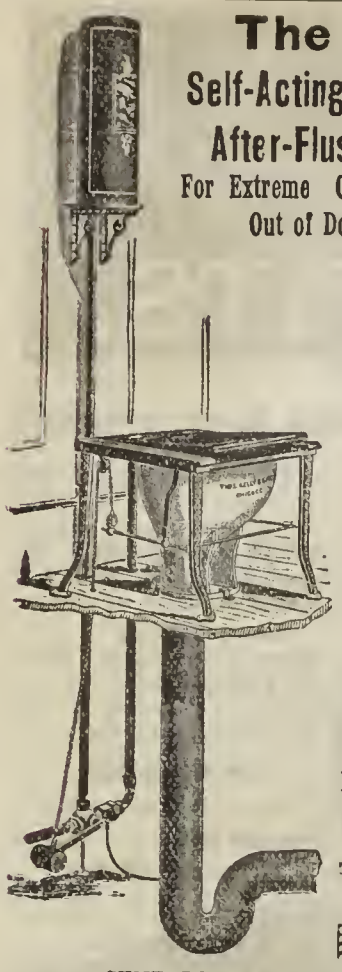
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"What are you doing now?"

"Waiting for some other fool with a return ticket."—*Life.*

— "I presume, my good fellow, you are a laborer?" said a lawyer to a plainly dressed witness.

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"To some extent. Those are not the principal implements of my trade, though."

"Perhaps you will condescend to enlighten me as to your principal implements?"

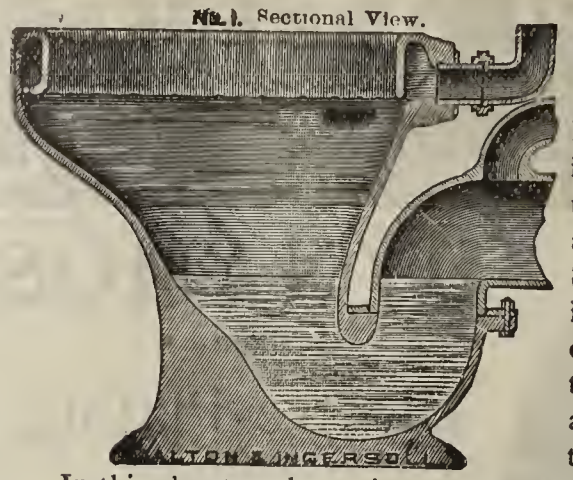
"It is hardly worth while. You don't understand their nature or use."

"Probably not," loftily, "but I insist on knowing what they are."

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The bowl contains a pool of water 7 x 6 inches. This is a much larger pool of water than has ever been obtained heretofore in the Short Hopper principle; and until now it has been considered an impossibility to construct a Short Hopper with a large standing pool of water that would discharge its contents. This we do in the *Boston Hopper* with the same amount of water that is required to flush an ordinary Short Hopper.

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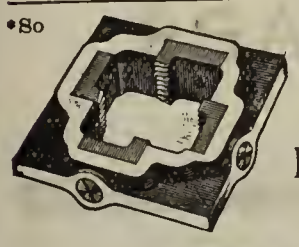
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If by chance you do not think these points, or the saving of money, objectionable,



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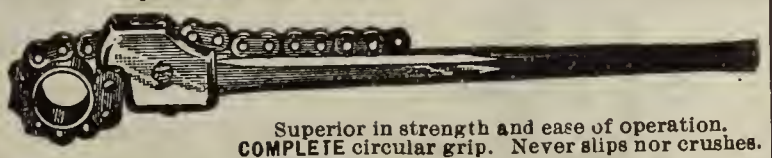


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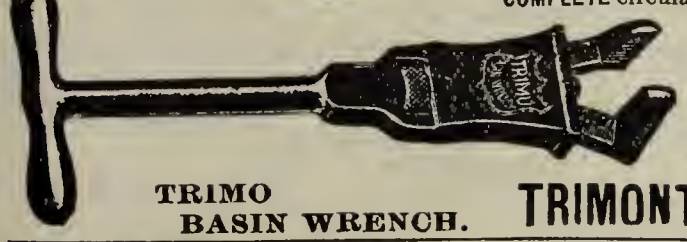
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Superior in strength and ease of operation. COMPLETE circular grip. Never slips nor crushes.



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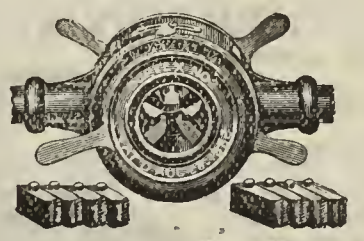
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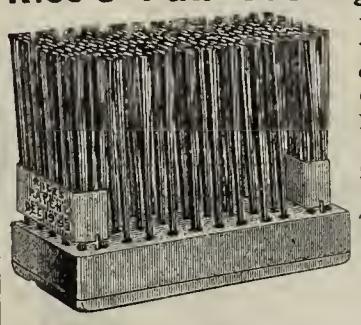
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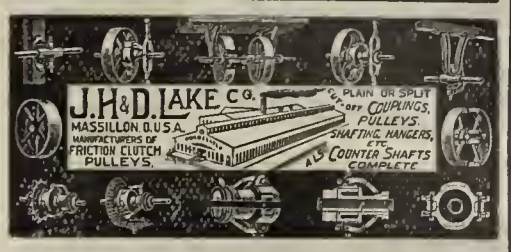
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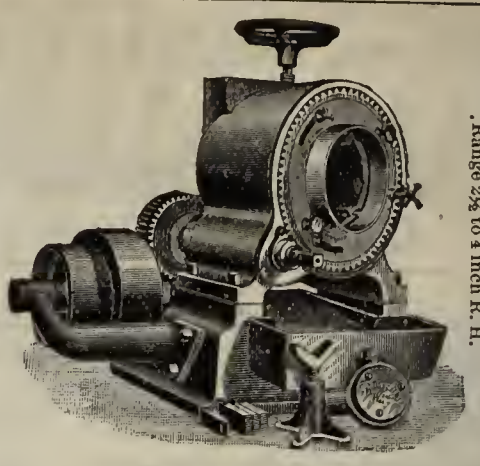
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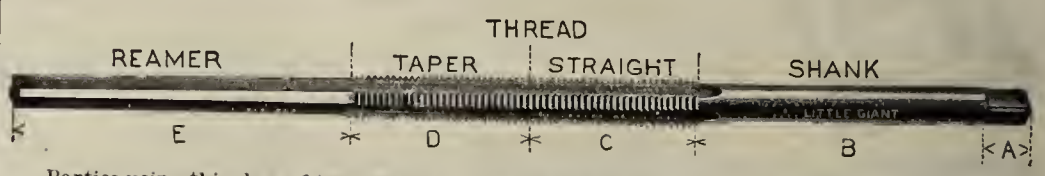
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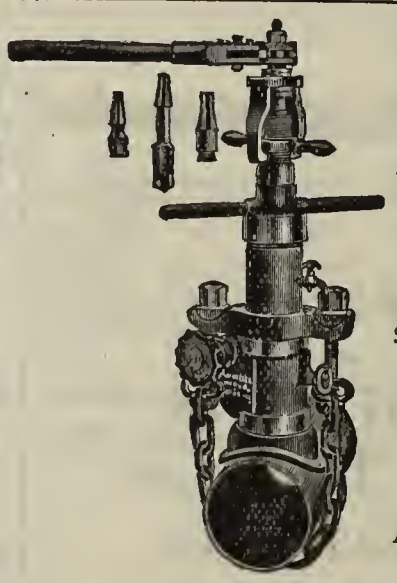
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Send for a sample gross, and after they are used you will have no other.

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Slate in all Forms also Slate Mantels.

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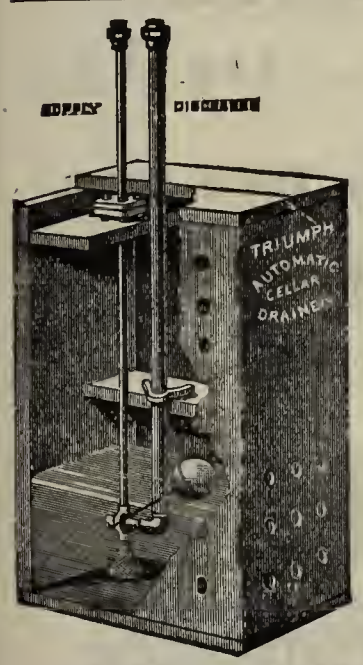
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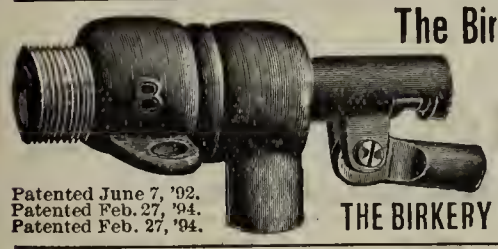
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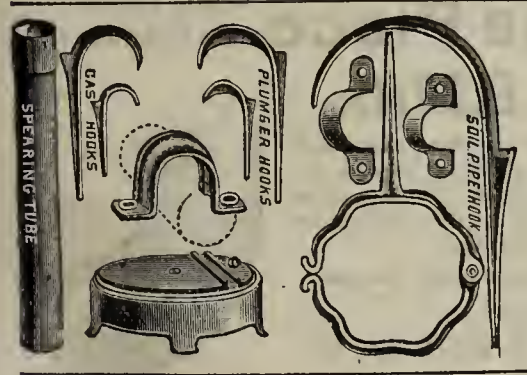
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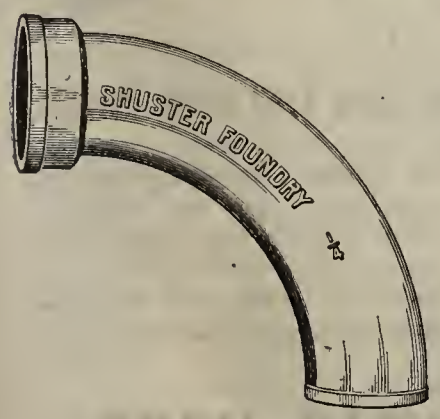
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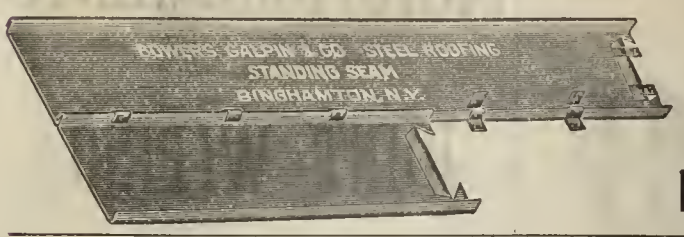
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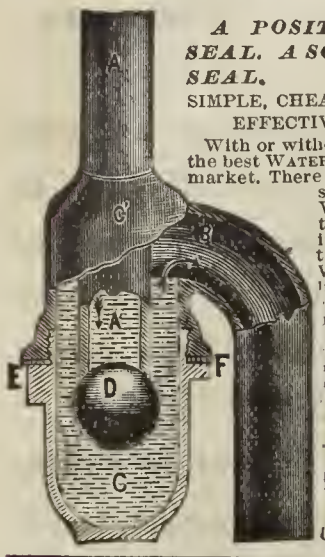
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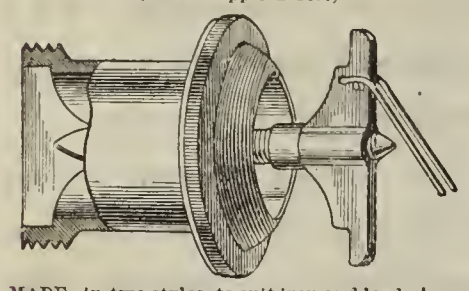
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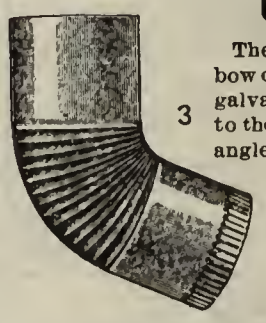
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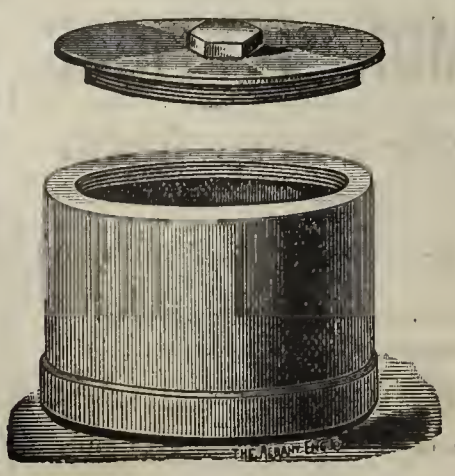
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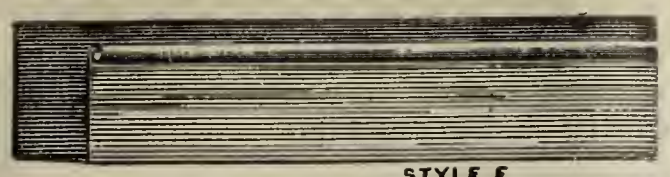
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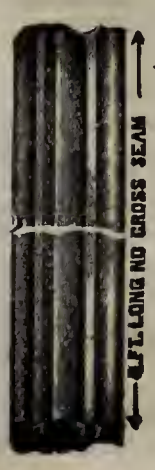


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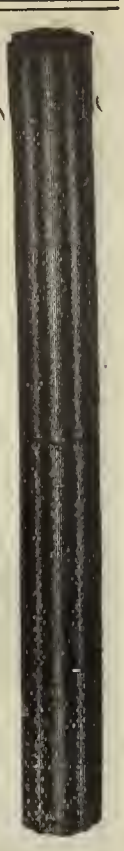
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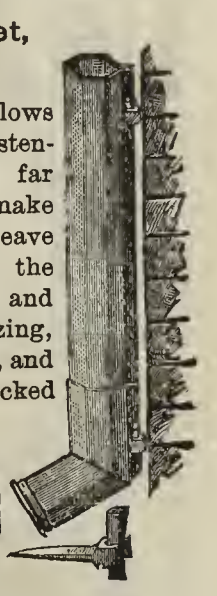
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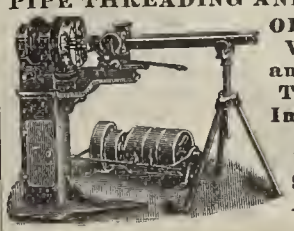


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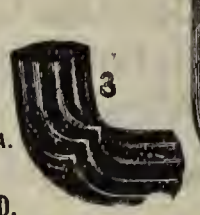
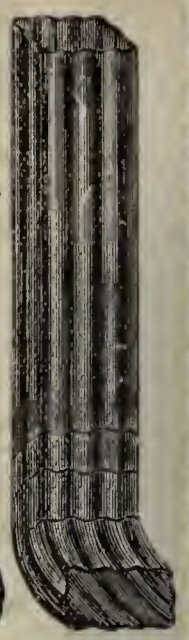
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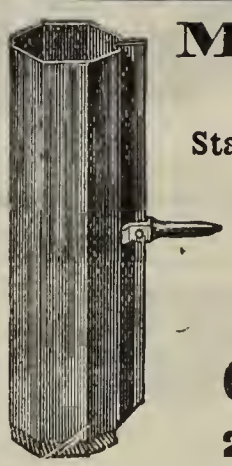
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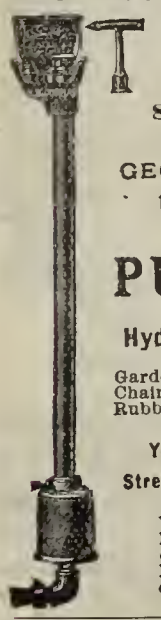
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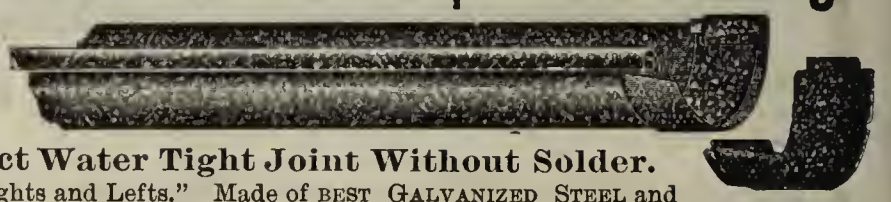
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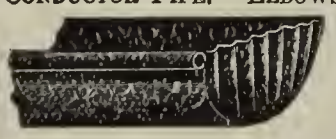
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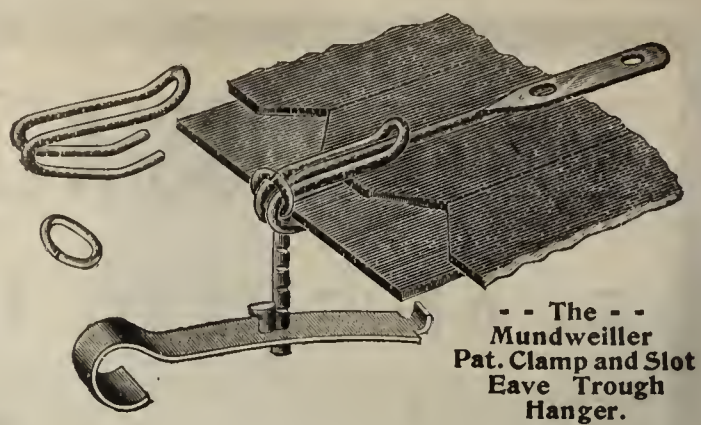
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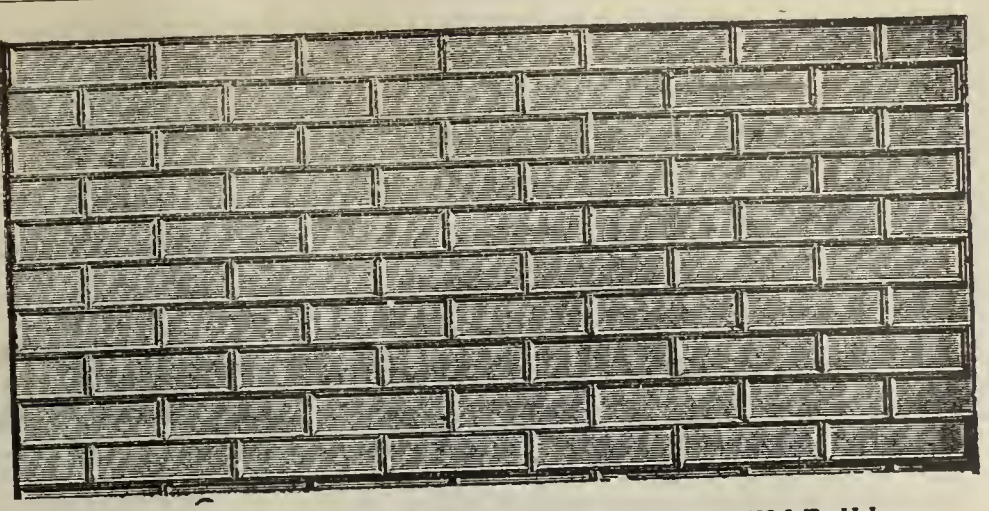
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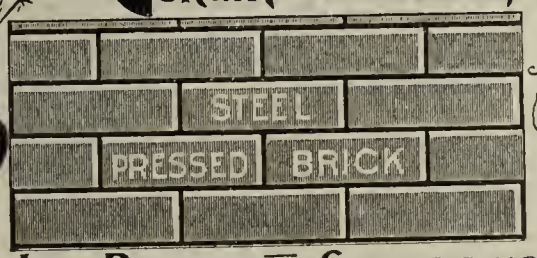
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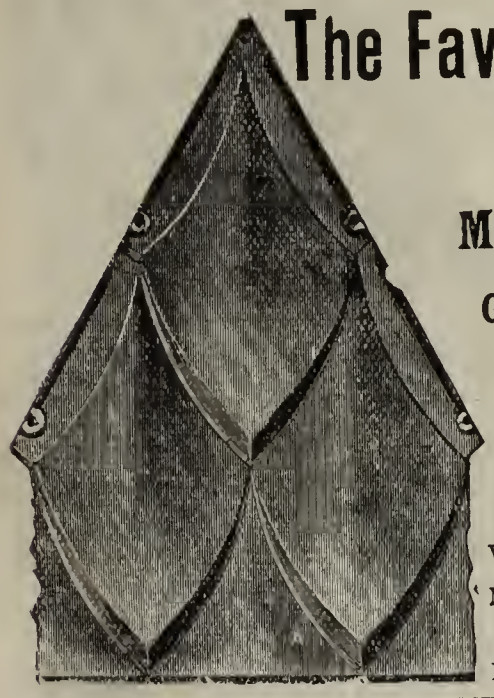
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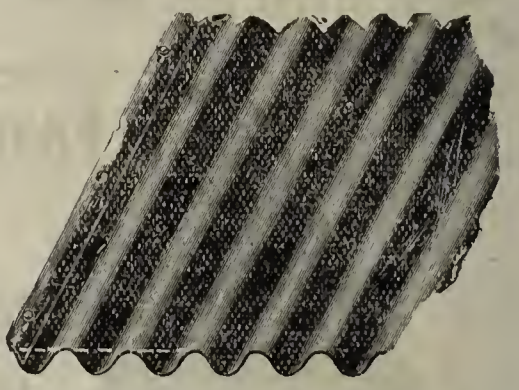
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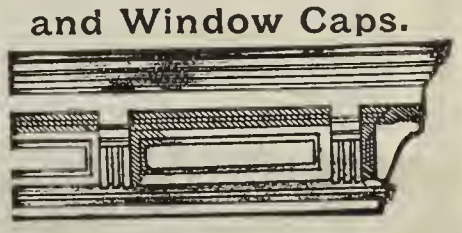
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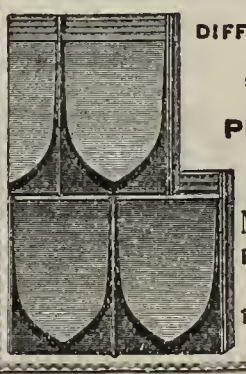
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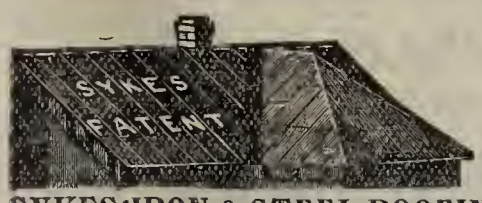
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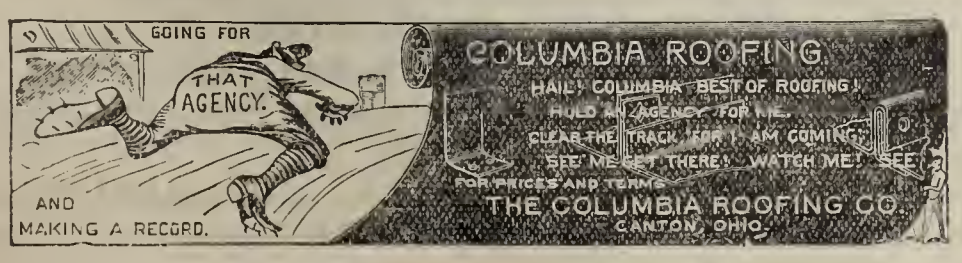
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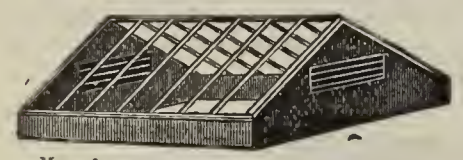
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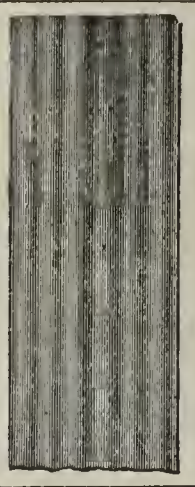
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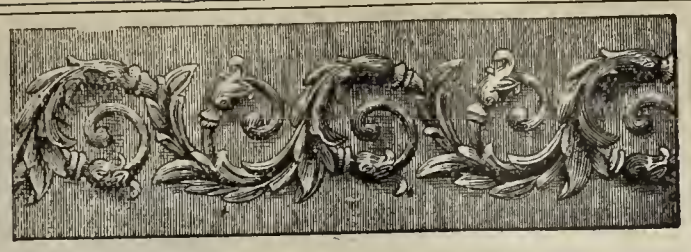
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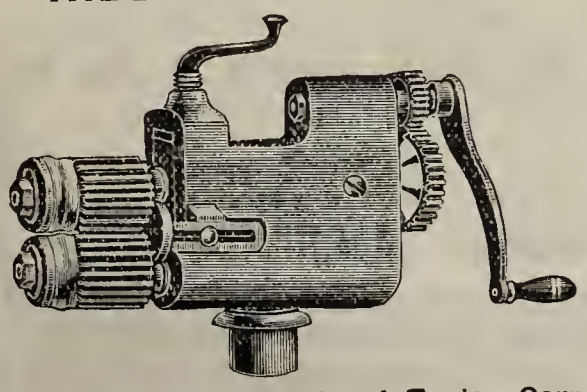
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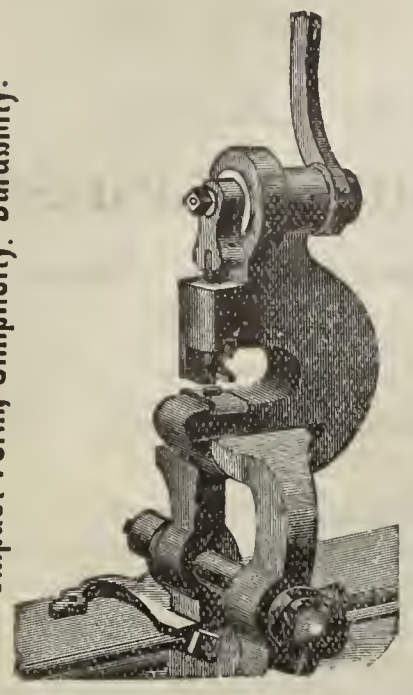
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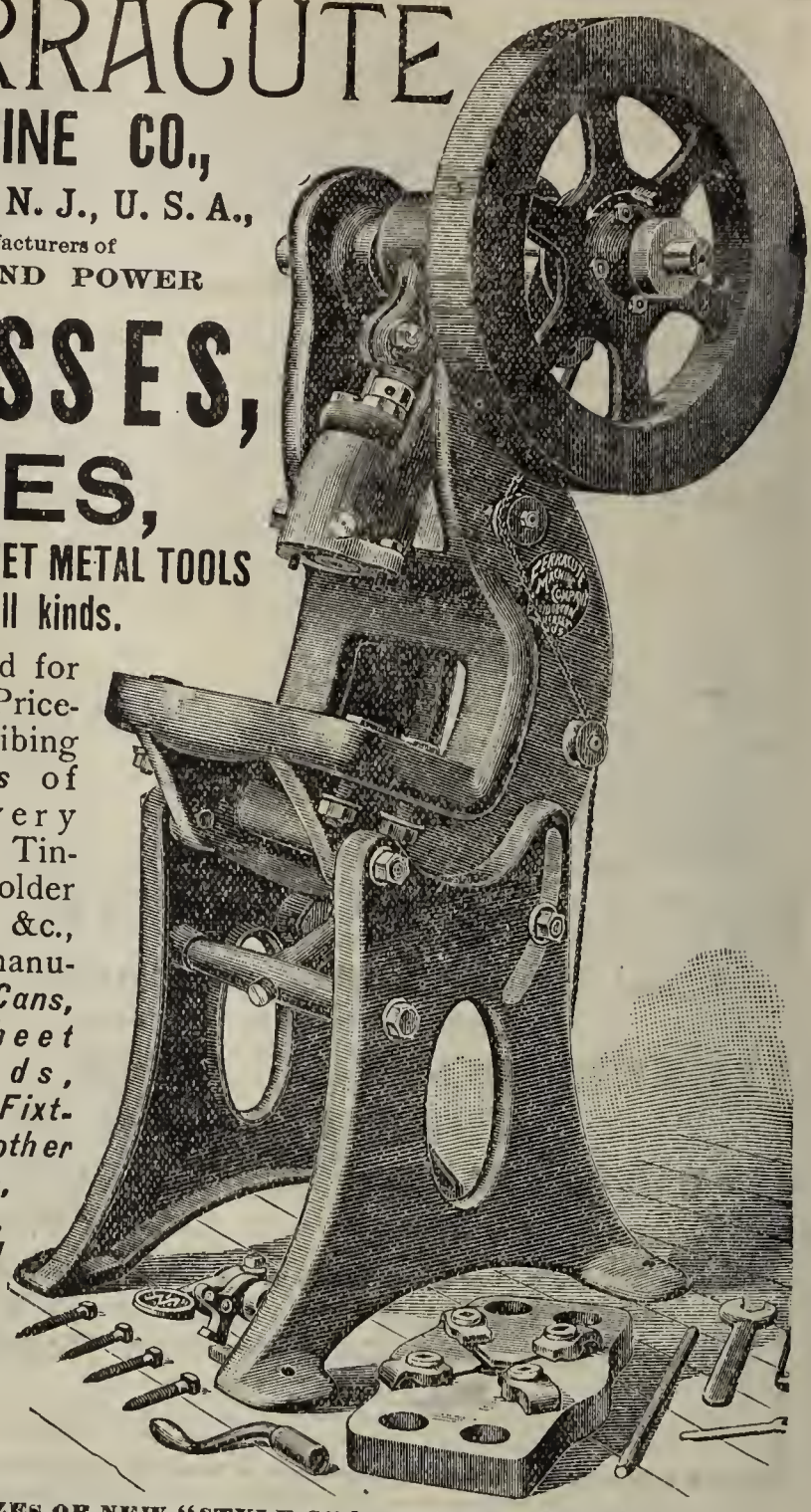
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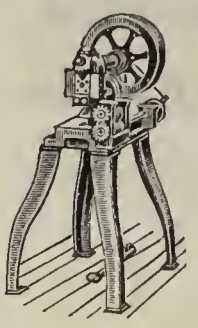
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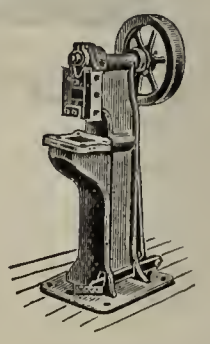
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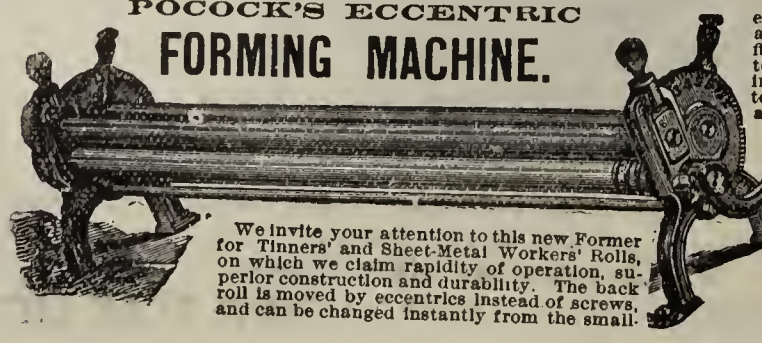
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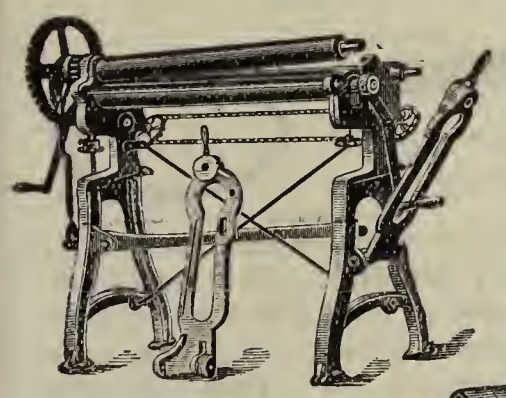
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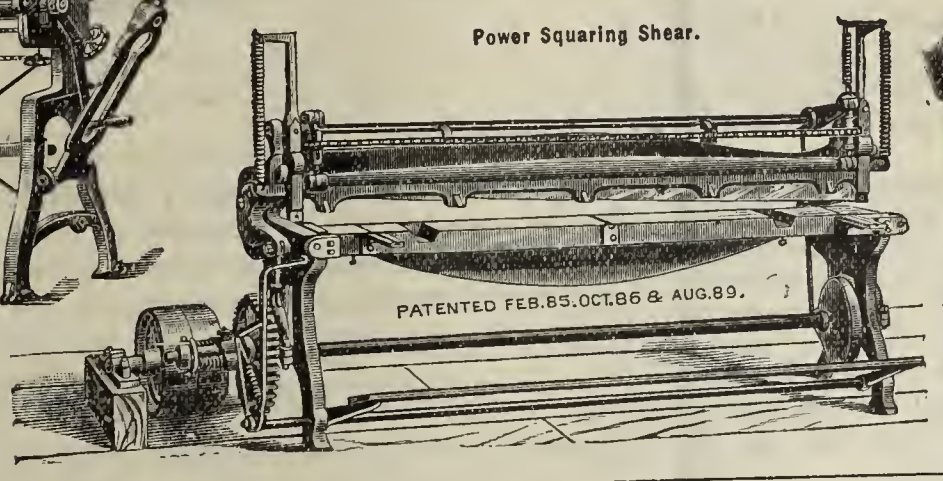
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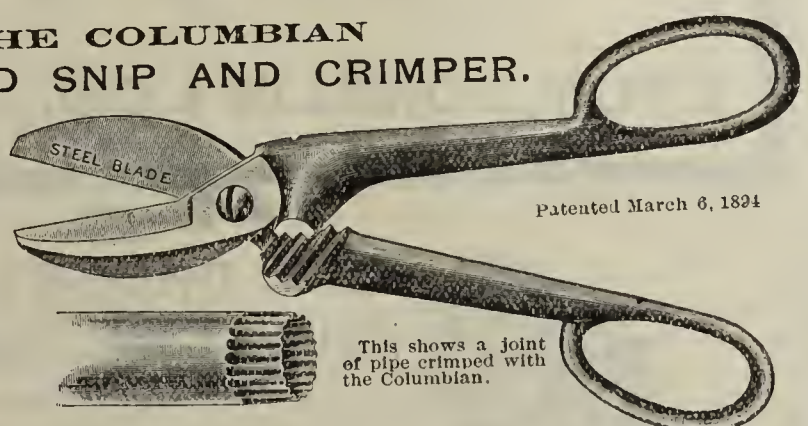
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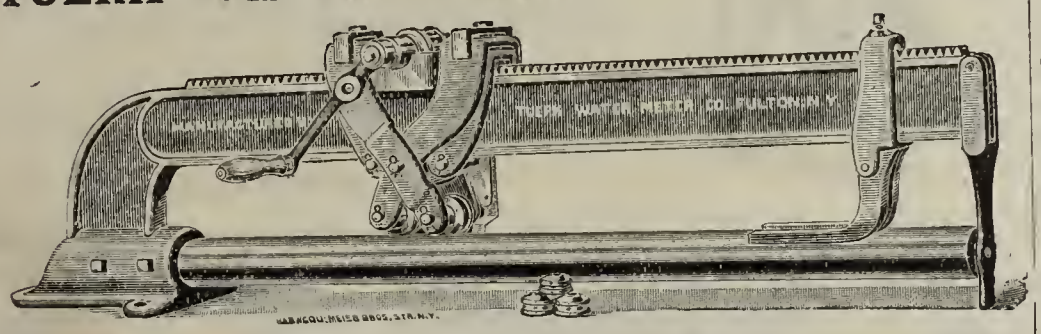
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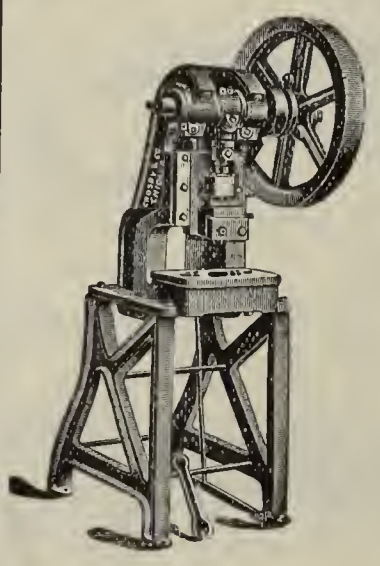
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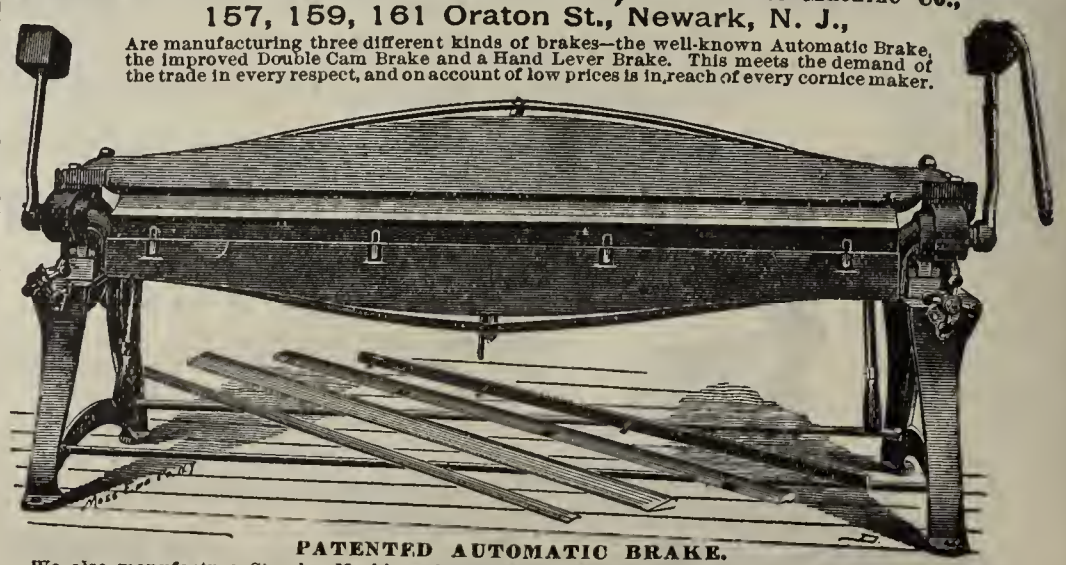
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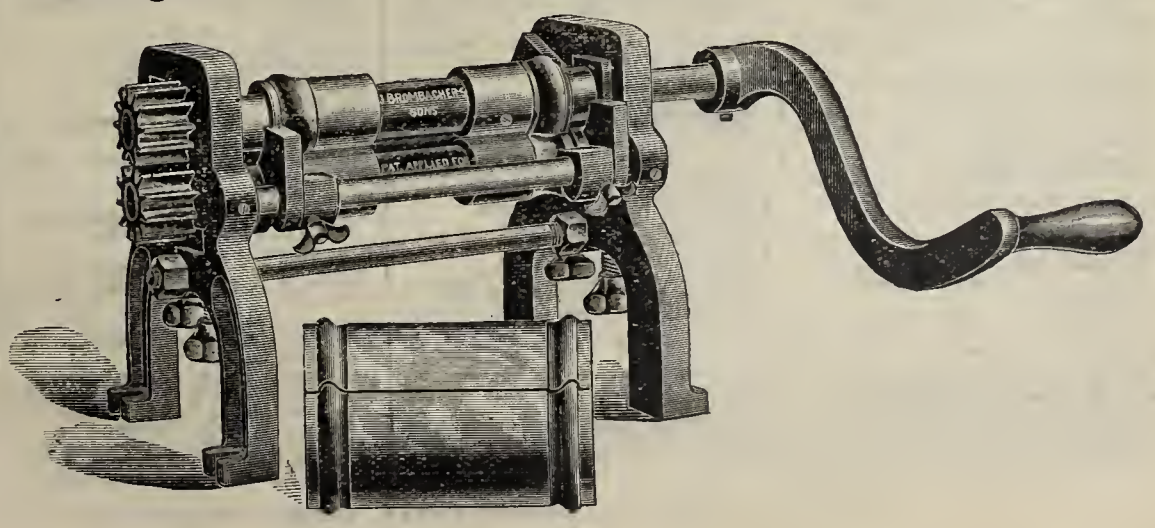
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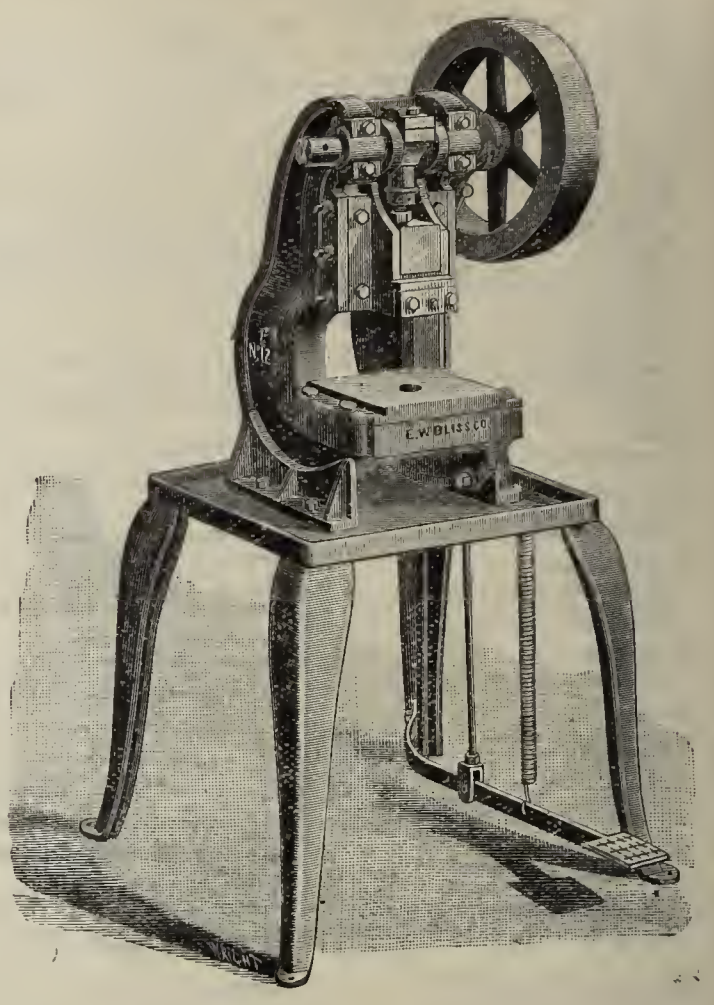
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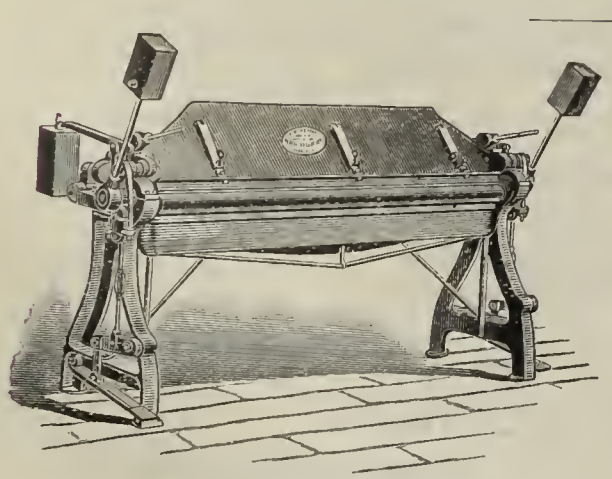
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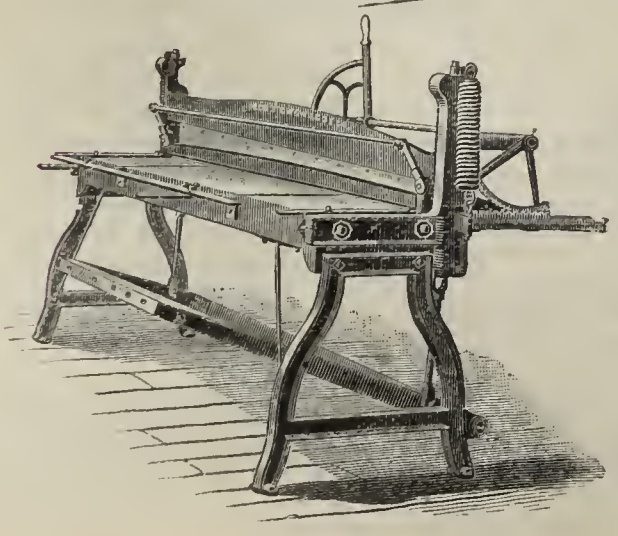
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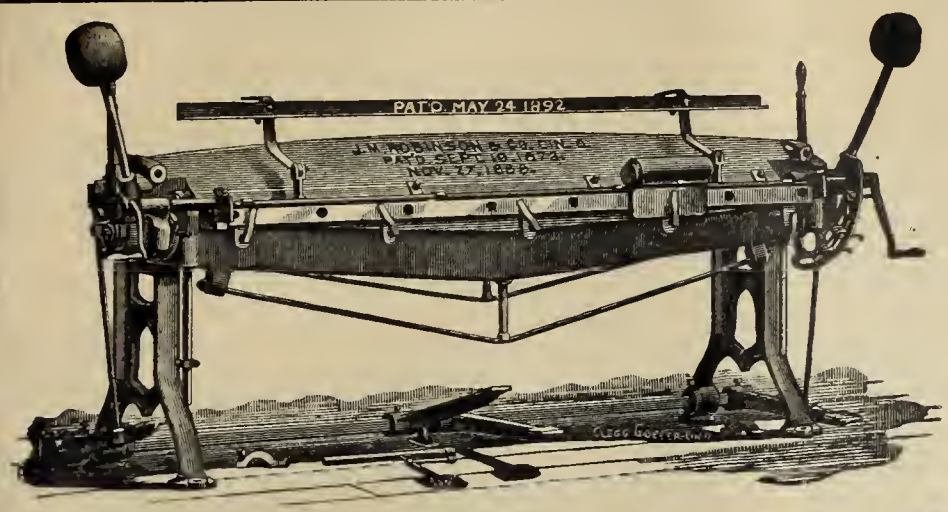
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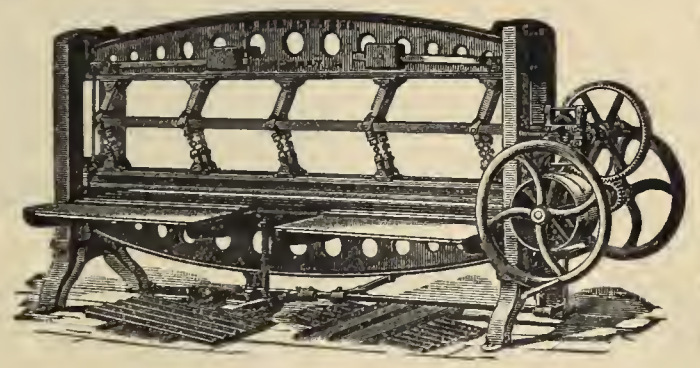


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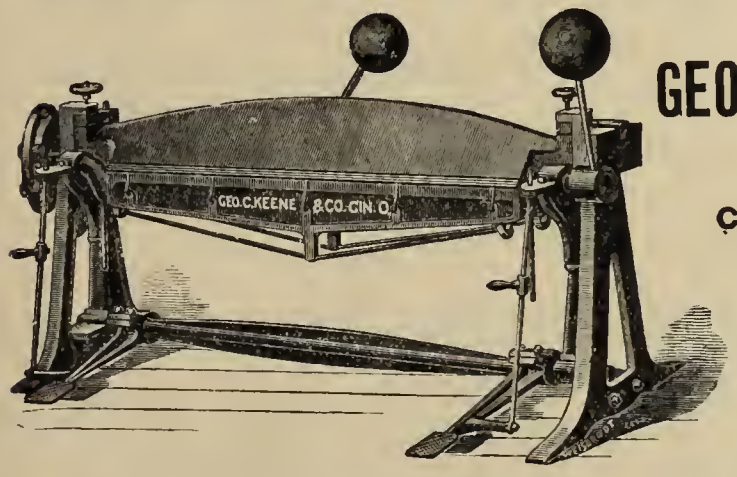
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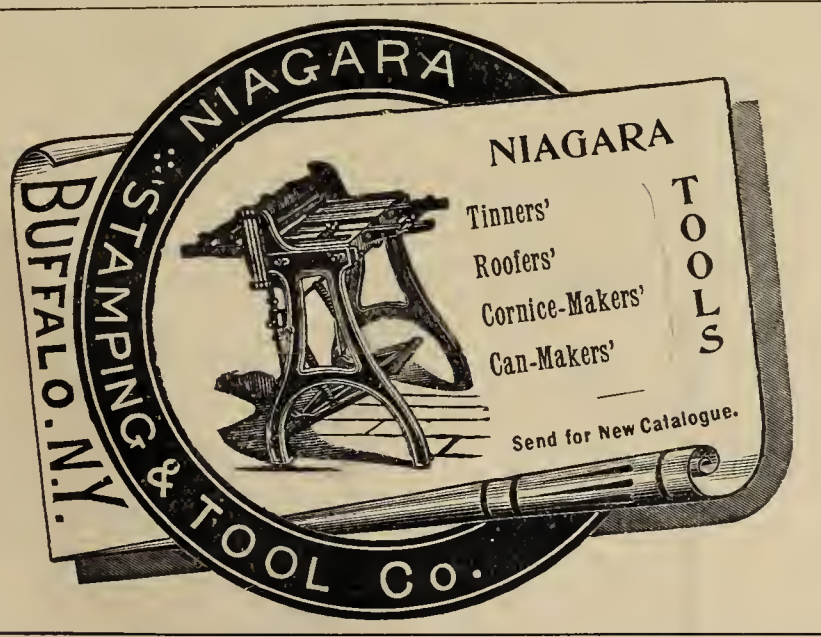
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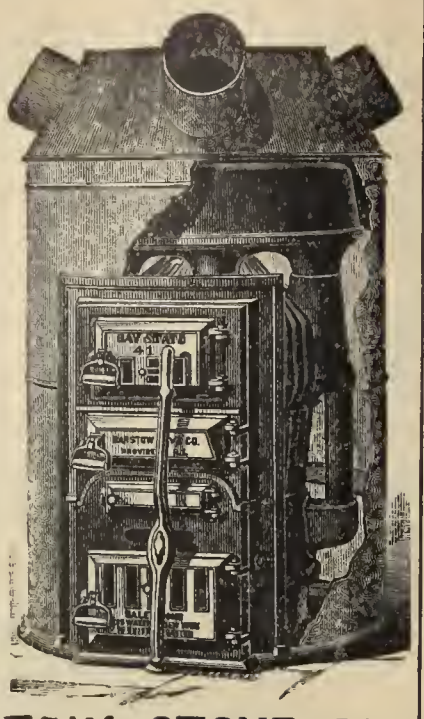
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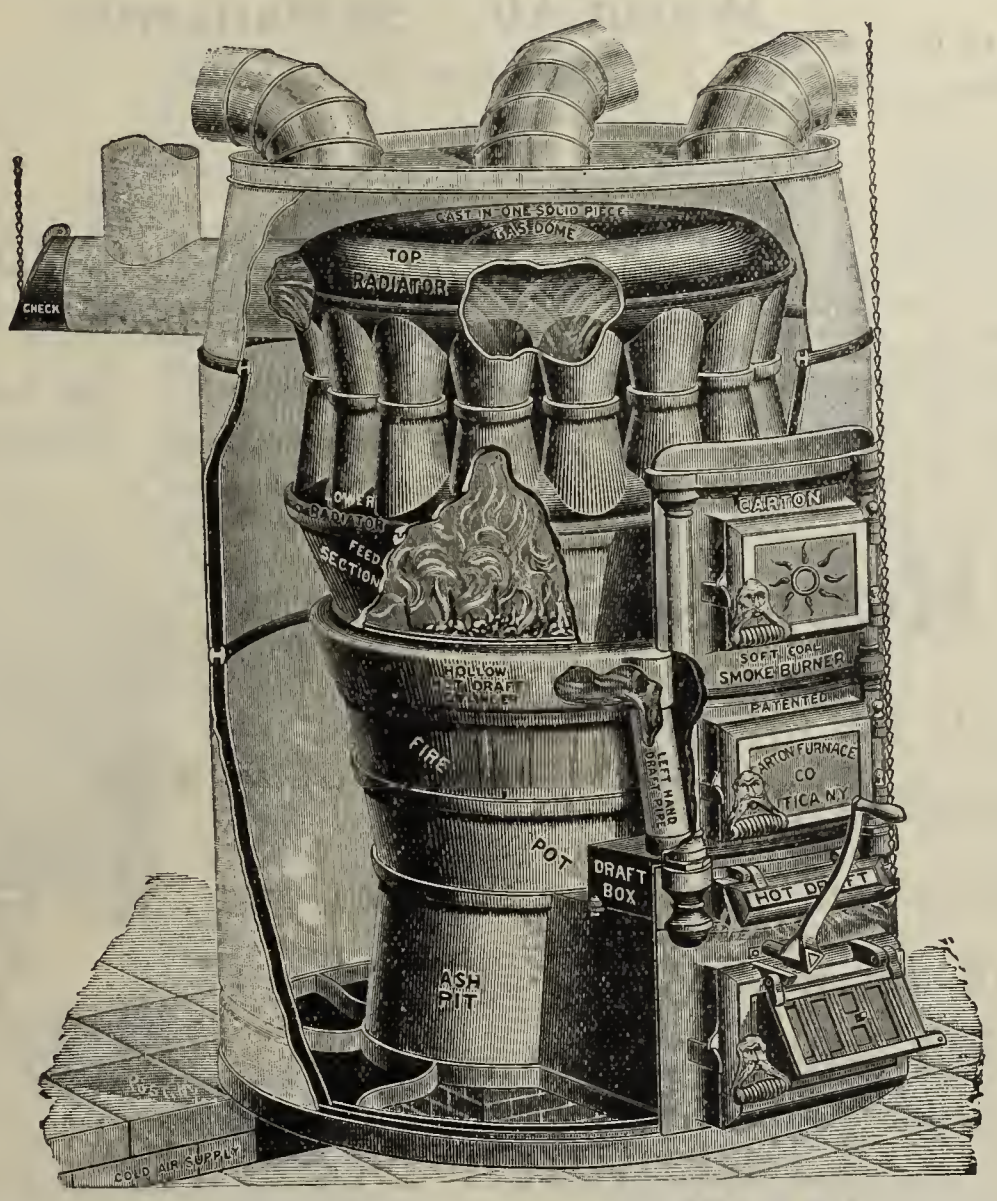
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ESTABLISHED IN 1847.

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Combinations, Steam, Hot Water, Warm Air. 20 Patterns.

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on his way to the Broadway Central Hotel at New York, where the *Convention of the Master Steam Fitters* will be held on the 19th, 20th and 21st of this month. He will explain to all people there the great merits of the



"THE SON DO MOVE"

Lindemuth Steel Sun Steam and Hot Water Boilers.

He will have a No. 2 SUN Boiler on the floor, polished and bright with its mellow rays gleaming. **LOOK FOR IT !**

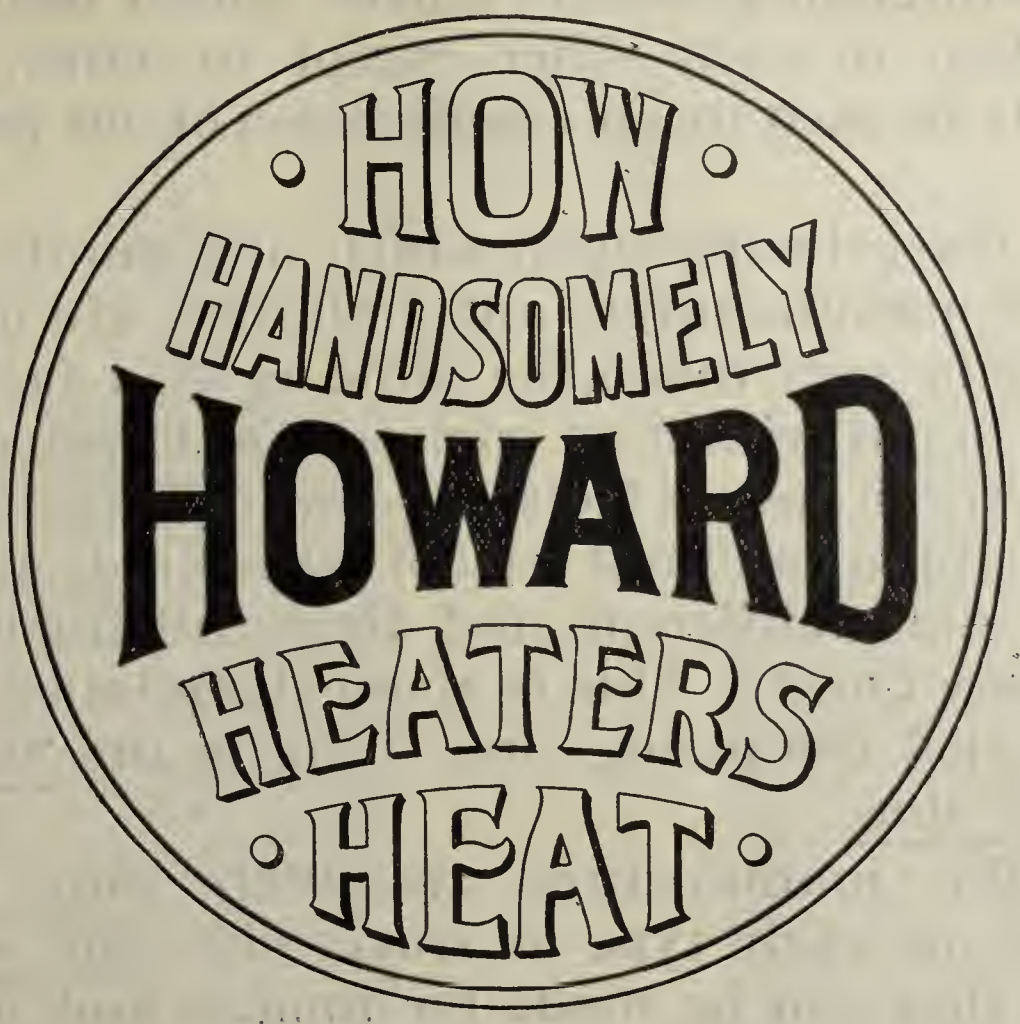
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between the line of "Garland" specialties and the various lines which are made up of several different grades of stoves which bear no relation to each other except in name, can easily be seen by an examination of our price-list.

The principle upon which any number of other manufacturers and imitators are operating is very much the same as if a farmer was to put within an enclosure a Jersey cow, a Durham cow, a Holstein cow, a Texas cow, a Montana cow, and a lot of other kinds, good, bad and indifferent, and then call them all "Jersey Cows." This is about the relation the so-called competing lines bear to the "Garland" line.

We manufacture absolutely only one grade of each type of stove, viz.: the very best that can be made for money, and merchants who are deceiving themselves with the idea that the "one name plan" as applied to a miscellaneous assortment of different grades, is a good one under which to operate, will soon awaken to a realization of the fact that it is absolutely and positively the worst plan upon which they could conduct their business.

GARLAND STOVES AND RANGES "The World's Best"

The Michigan Stove Company.

Largest Makers of Stoves and Ranges in the World,

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Some scraps of Estate Oak History.

"These are facts, not fancies manufactured in our office."

J. C. MURDOCK,
Hardware, Stoves, Iron and Steel.

Galena, Kansas, May 24, 1894.

F. & L. KAHN & BROS., Hamilton, Ohio.

Gentlemen:—We have here a poor quality of coal, a good deal of slate and sulphur mixed with it; consequently hard on grates and stoves. Your ESTATE OAKS are the stoves for here. They don't smoke, keep fire longer, more durable than any make of stoves coming to this town. The advantage of handling your stoves are: Free from breakage (your mode of crating all your stoves), are strong, neat, durable and sell without much task. I tell my customers I am selling the best Oak made. I believe it myself and give a full guarantee that the ESTATE OAK is the best Oak made to date.

Trusting the pleasant business relations existing in the past will long continue, I am,

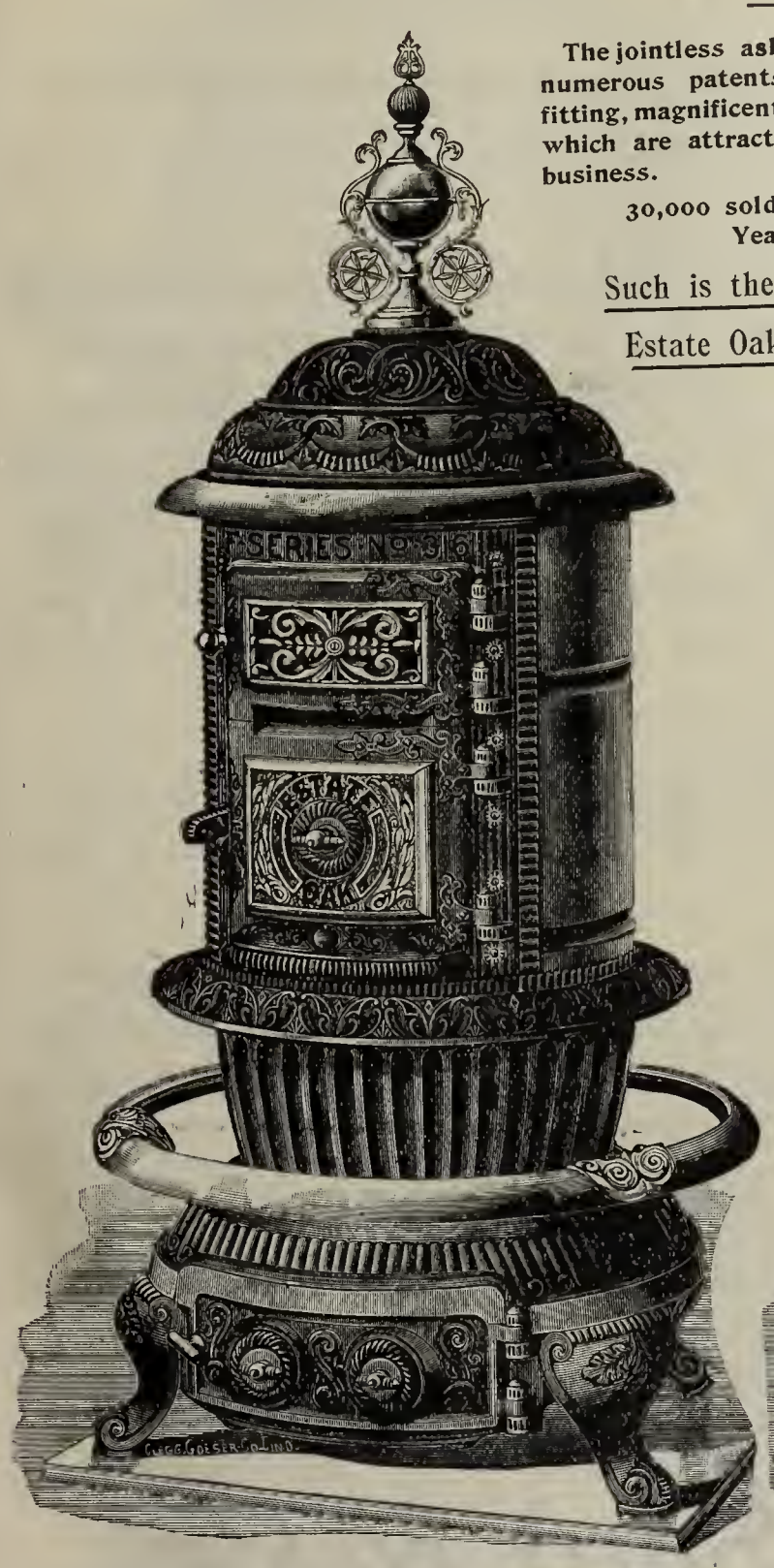
Yours,
J. C. MURDOCK.

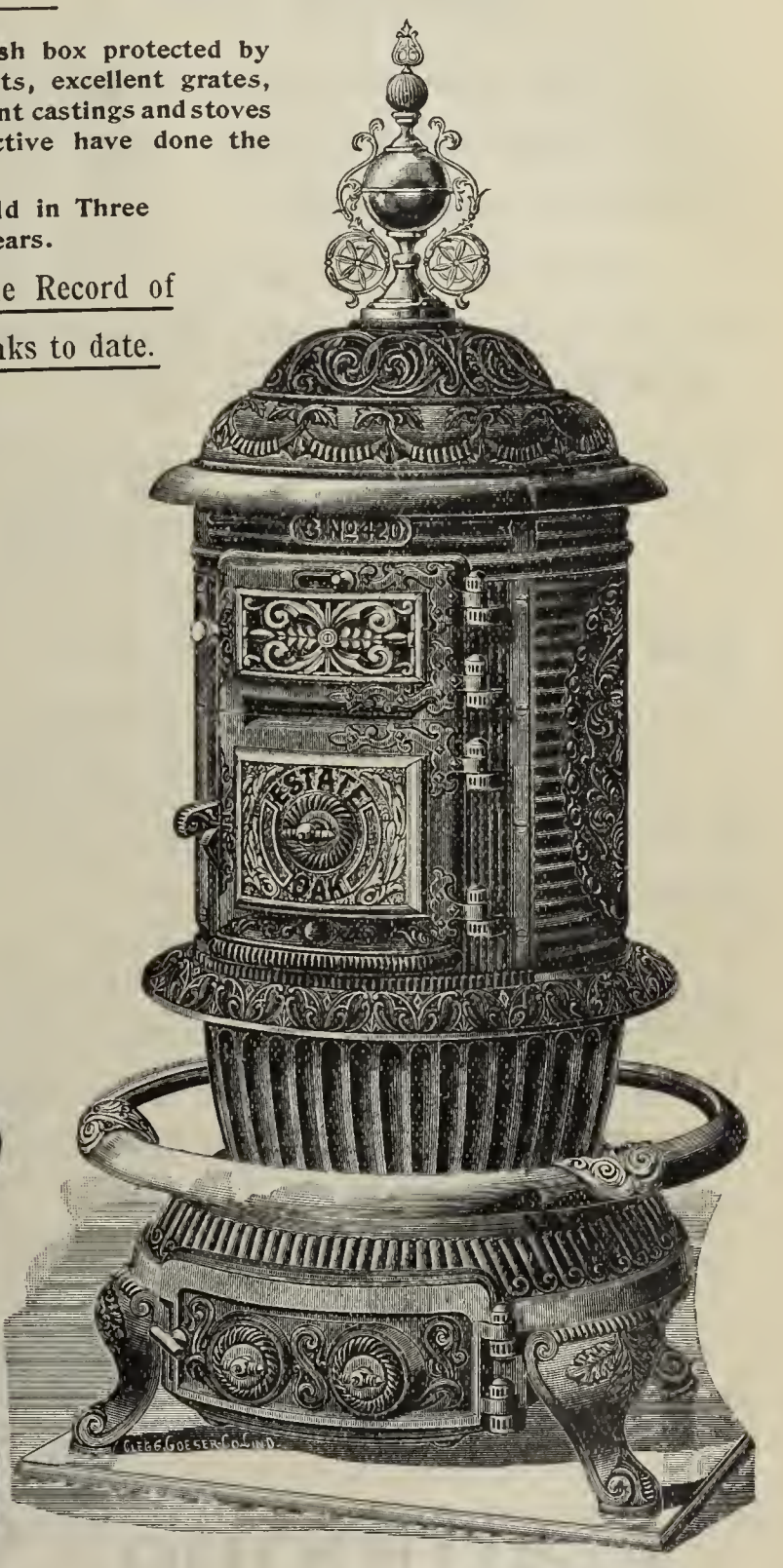
We have large numbers of similar letters from customers in Ohio, Pennsylvania, Indiana, Illinois, Iowa, Misscuri, Kansas, Nebraska, Kentucky, Michigan, Wisconsin, Minnesota and elsewhere, the originals of which will be furnished to those desiring to see them with pleasure.

The jointless ash box protected by numerous patents, excellent grates, fitting, magnificent castings and stoves which are attractive have done the business.

30,000 sold in Three Years.

Such is the Record of Estate Oaks to date.





My Folks are

F. & L. Kahn & Bros.,

And my Home is in

Hamilton, Ohio.

N.B.

I have often heard confidential whispers that heaps of profit are made on me by the fellows who put me out to service.

The United States Government has granted us letters patent on our

Acorn Radiator

As follows:

January 23, 1894, No. 23,013, on Design.

March 13, 1894, No. 516,617, on Construction.

These patents embody the essential features of our **ACORN RADIATOR,** which have made this stove the most desirable, original and beautiful Coal Heating Stove that has been produced for many years past.

It has come to our knowledge that certain stove manufacturers, having learned of the great popularity of the **ACORN RADIATOR,** finding that it had interfered with their trade in other constructions and realizing that this new type of stove was destined to supplant other less scientific methods of heating, are proposing to appropriate our invention by making a similar stove, copying both our design and construction.

We do not desire to monopolize so important an invention. The stove buying public **must** have more stoves of this kind than we are able to supply; but we do not propose to have our inventions or other property appropriated by others without compensation.

We have, therefore, decided to offer to a limited number a license to use our inventions as described in letters patent No. 516 617, but we shall not license any one to use our design patents.

We hereby warn the public that to make, buy or sell any stoves embodying any of the inventions patented by us as above will render the violator liable to prosecution under the United States laws, and as we offer to license others to manufacture this stove, the stove buying public will do well to refuse to buy any stove which infringes our patents, except the parties manufacturing have a license from us.

It is our intention to bring suit against those who infringe upon our rights.

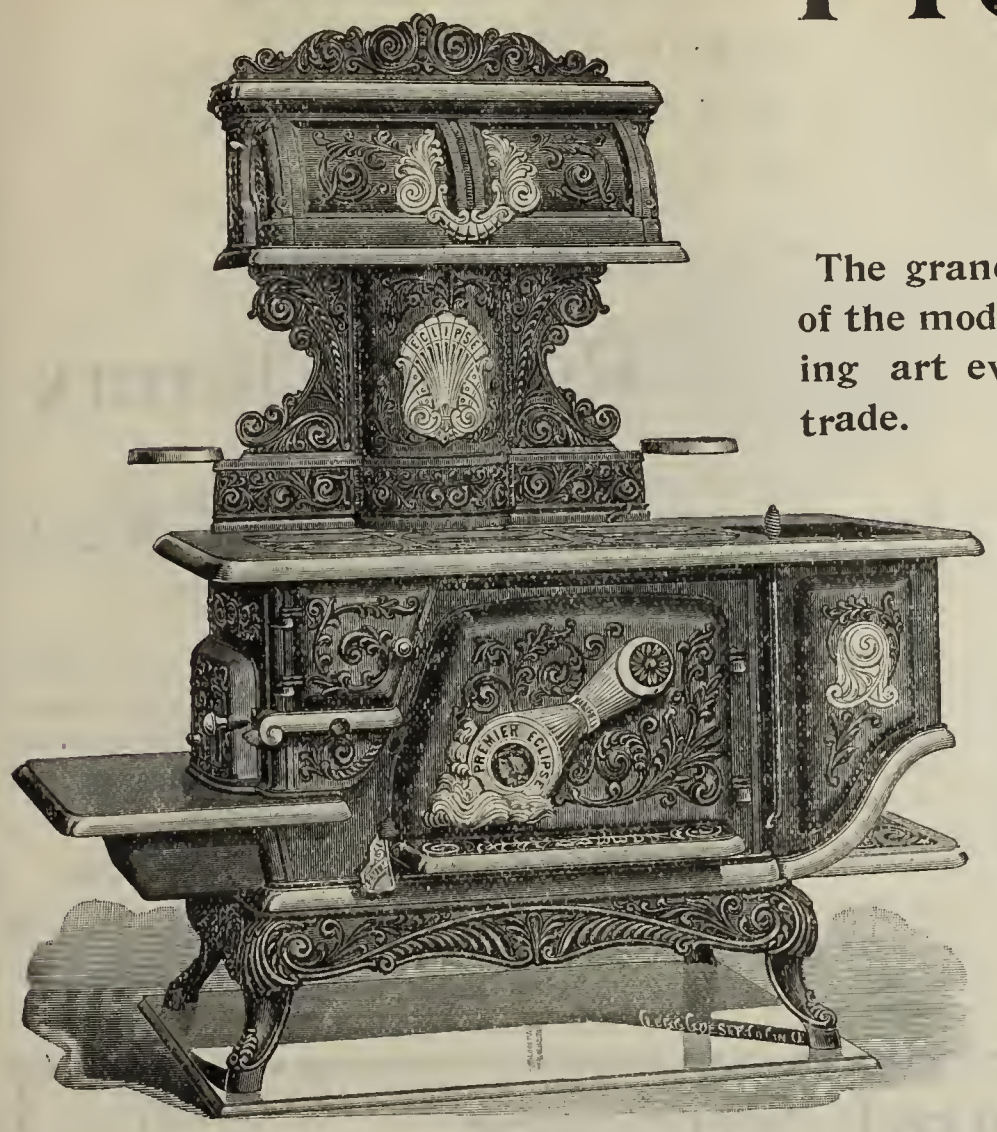
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Premier Eclipse



The grandest production of the modern stove making art ever offered the trade.

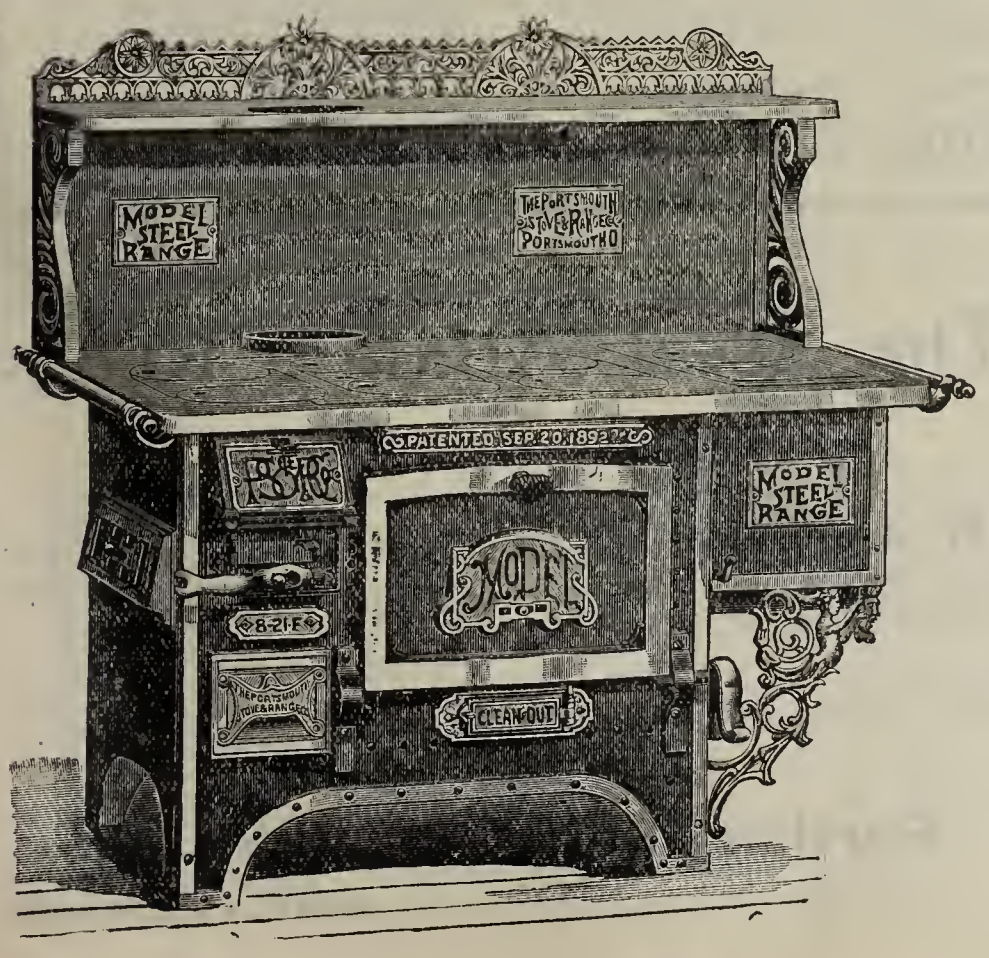
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The Eclipse Stove Co.,

MANSFIELD, O.

The "Model"

With Flush-Top Reservoir.



WITH OUR VALUABLE ADDITION, THE

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which may be removed at will and permits entire freedom of draft. No rods, bolts or other parts in the way, to become loose or get out of order; something all have been striving for and the dealer has demanded. It's the simplest and best of 'em all. The Model Ranges are the only productions of the kind embodying this and numerous other excellent features. Address for full particulars

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Three Sizes: Nos. 14, 16, 18, Single or Double Sectional Fire Pot.

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Among the Special Constructive features of the Round Climax are a jointless ash pit, fitted with hinged draft valve in ash pit door, which can be regulated by a thumb screw to make an almost absolute **AIR TIGHT ASH PIT.** Has large ash pan, draw center shaking grate (manipulated from the outside), and is handsomely trimmed with nickel.

With **one bucket of soft coal** weighing 26 pounds fire has been retained **sixty-nine hours** in the No. 16 Round Climax.

Ferrosteel and Success.

A GREAT COMBINATION

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"The Ferrosteel Range is received, and is all you claim for it."

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Of course Ferrosteel Ranges are a success, because Ferrosteel Metal has no equal for stove construction. Ferrosteel Ranges right in working qualities and taking in appearance. The Ferrosteel Factory is situated so that we can secure best freight rates to any point in the United States.

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A NEW MEDIUM PRICED RANGE.

DESIGNED for a leader to sell in the same class with highest grade goods, but at a lower price.

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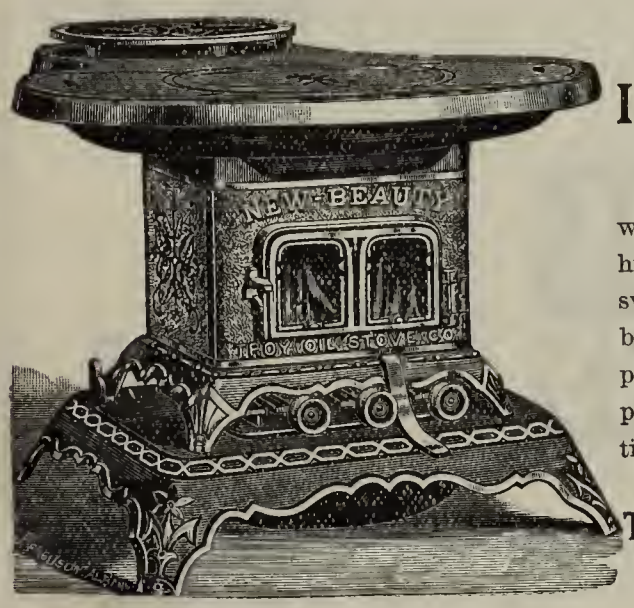
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Parties dealing in oil stoves would do well to compare the hinge on this stove that the body swings on with others that may be offered them, as we are the patentees of said hinge, and shall protect ourselves against all parties infringing.

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Write for Catalogue and Prices.



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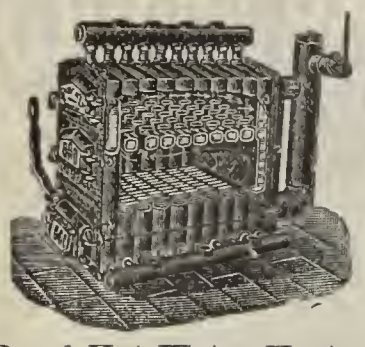
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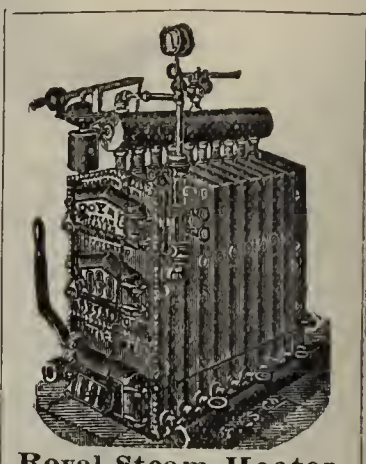
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Sold on their Merits,

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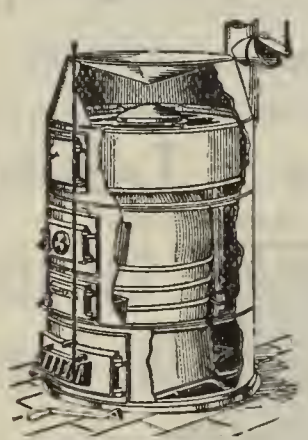
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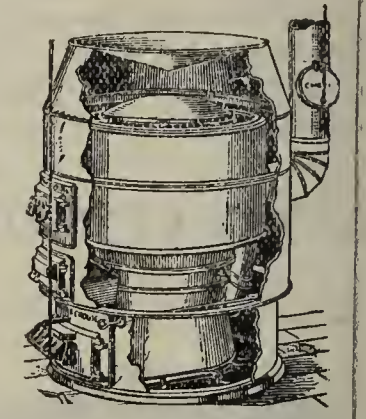
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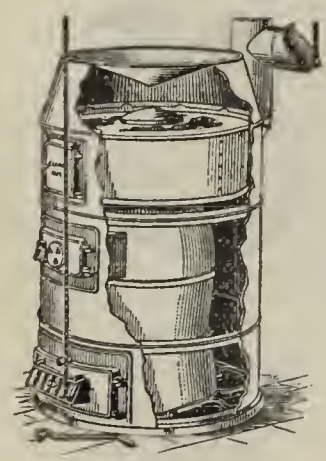


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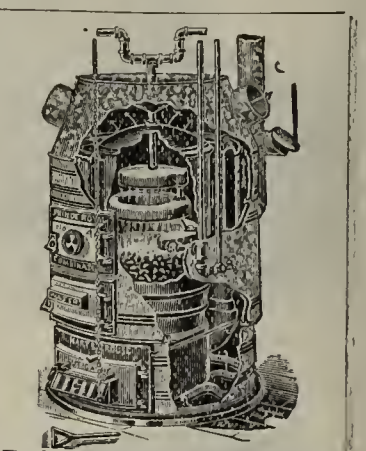


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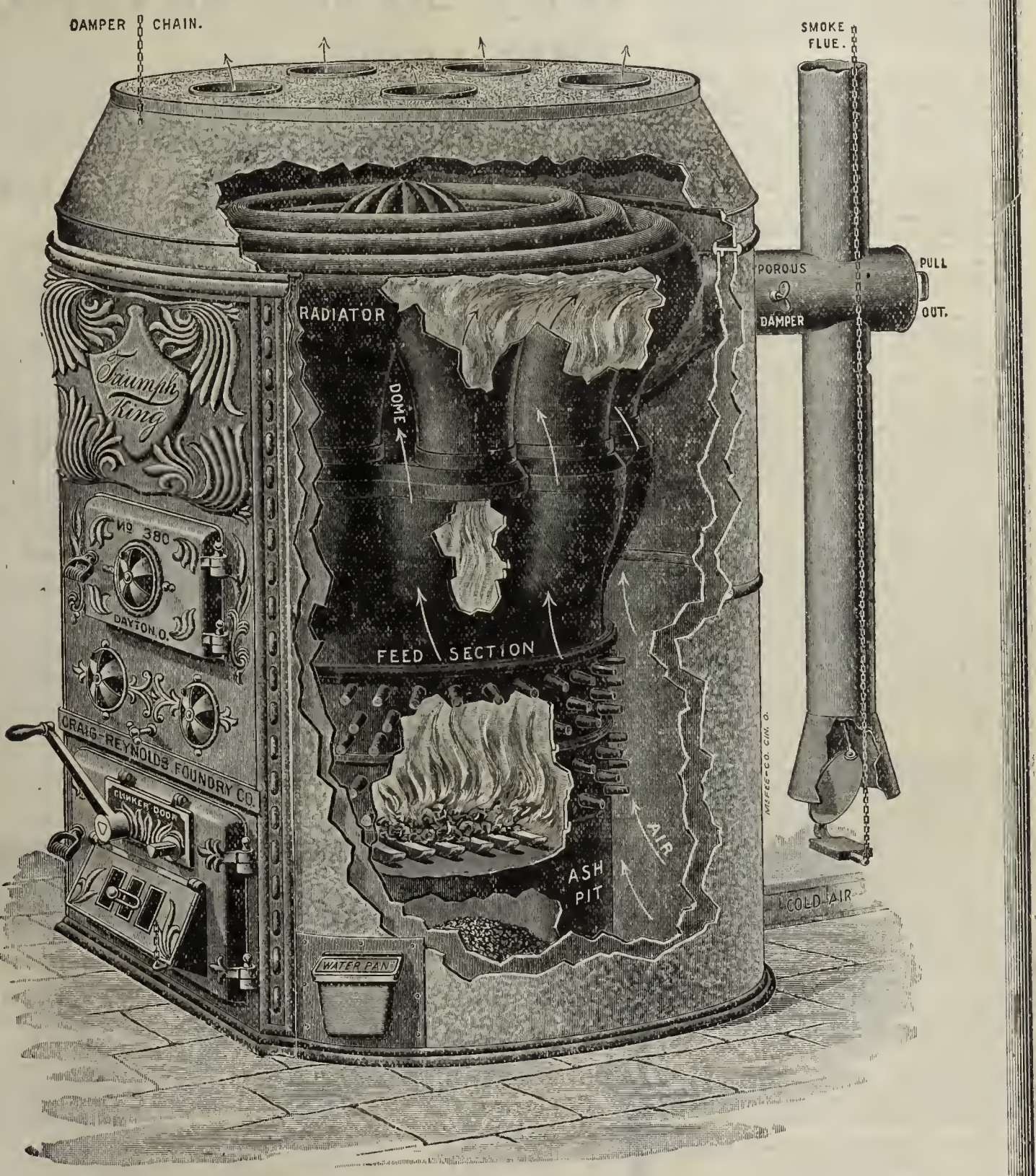
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With Introduction and Tabular Comparisons.

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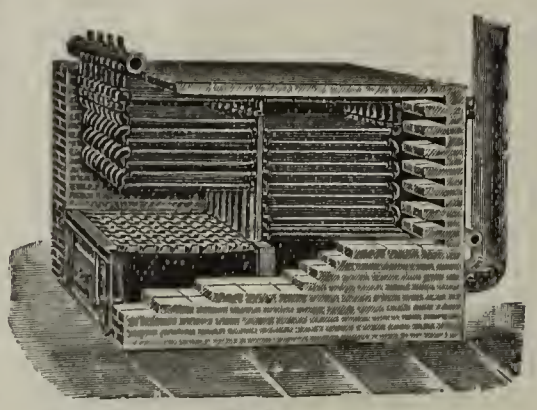
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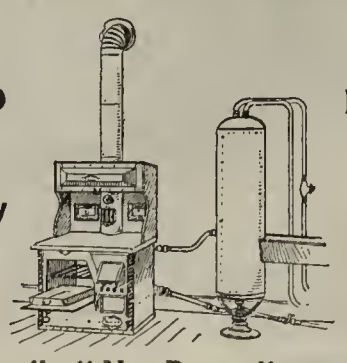
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CONNECTS LEAD to IRON PIPE.

Absolutely Air and Water Tight.

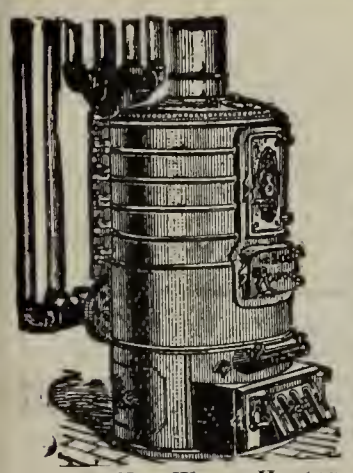
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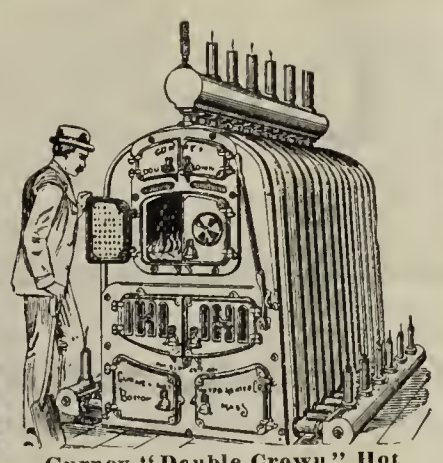
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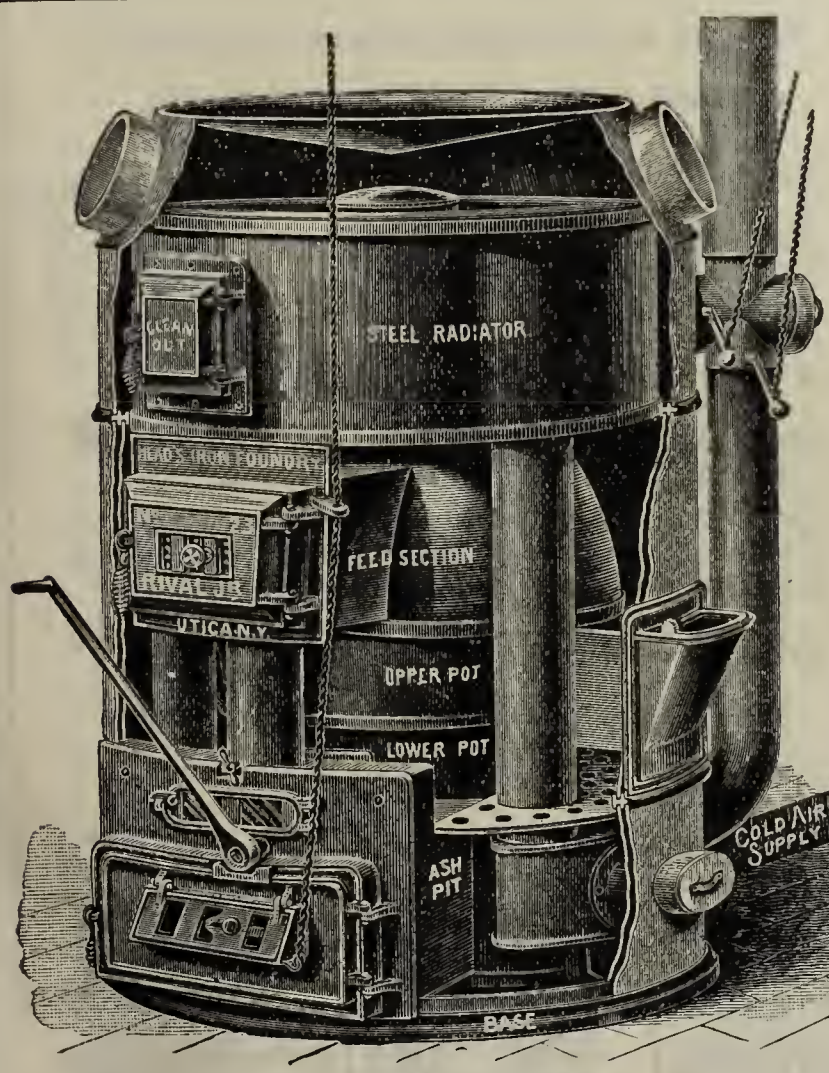
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Their Requirements.

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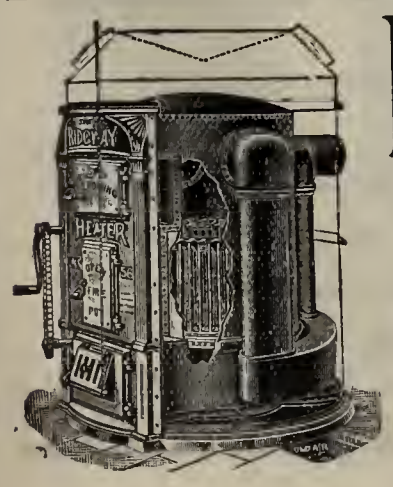
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— A Practical Sarcasm.—"You don't look like ye'd had very bad luck at that house," said Plodding Pete.

"I got a cake," replied Meandering Mike.

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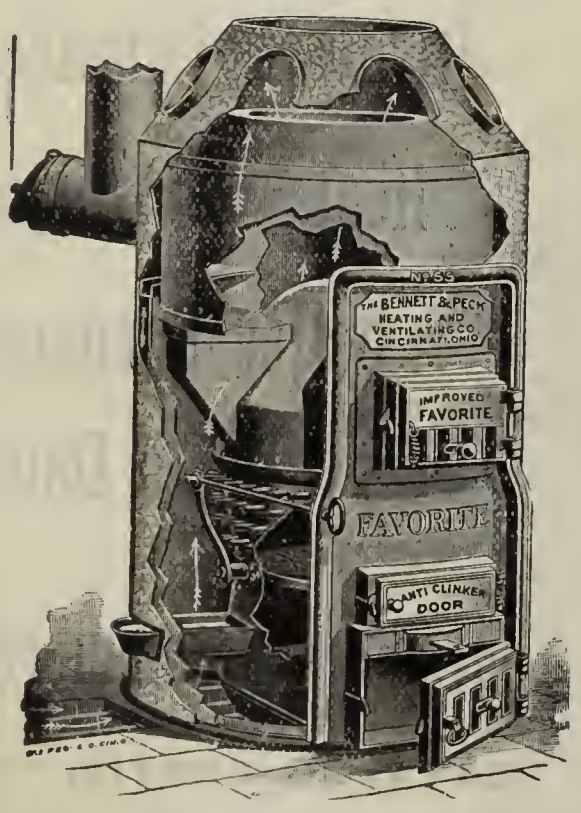
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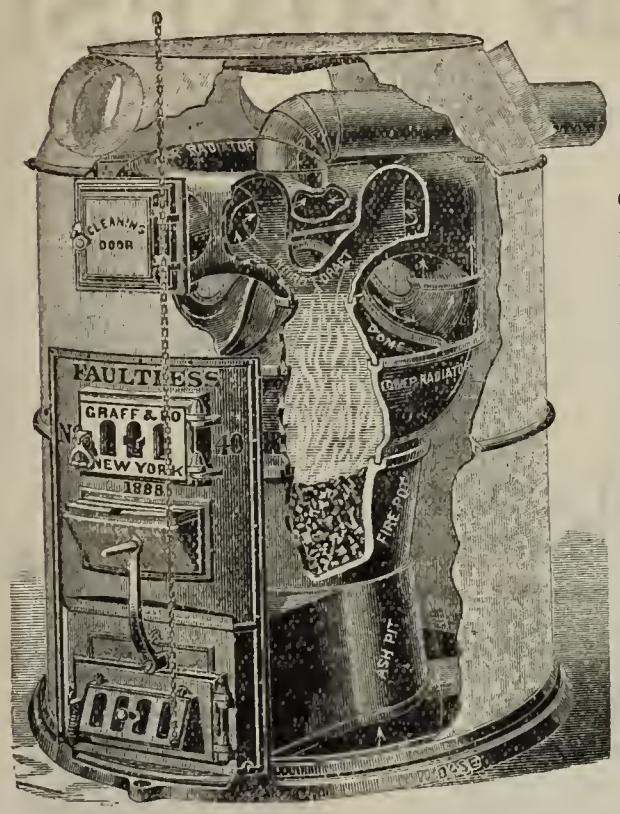
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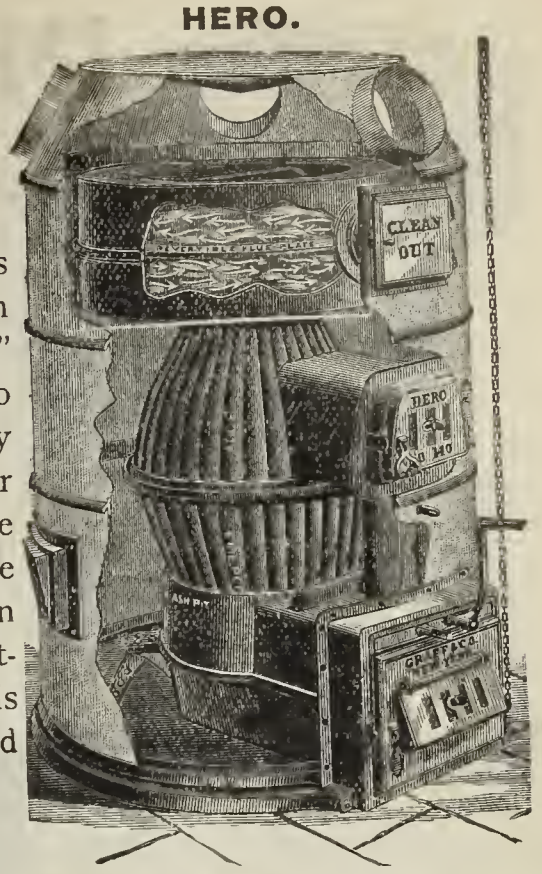
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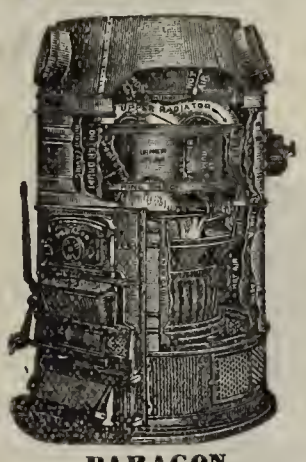
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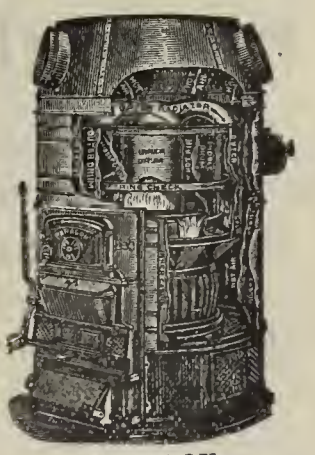
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FIDELITY.

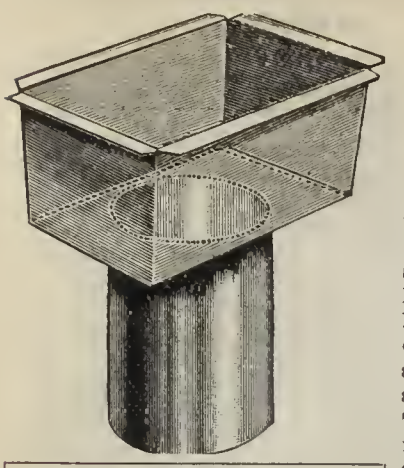


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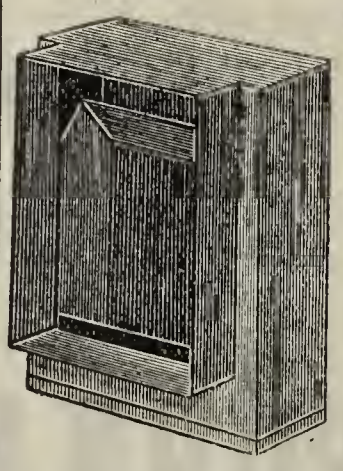
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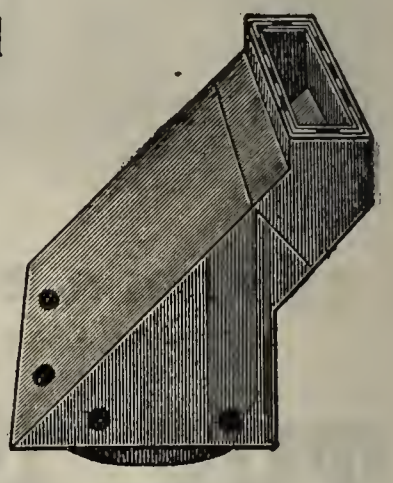


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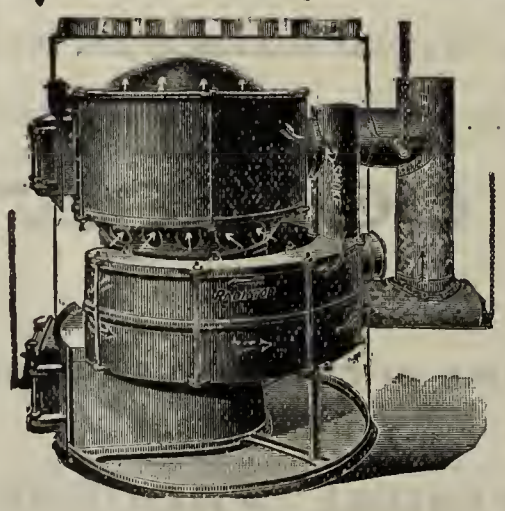
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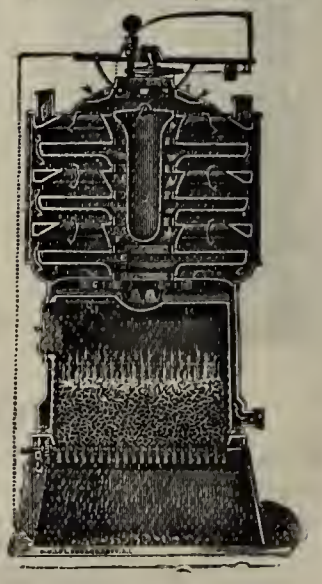
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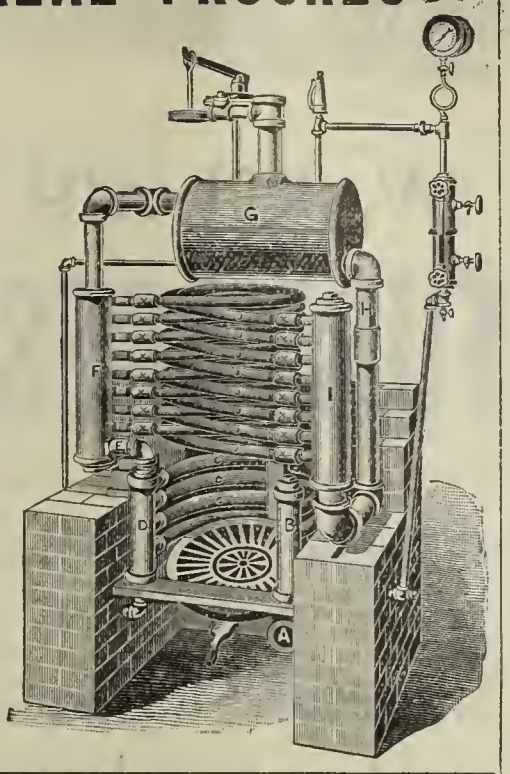
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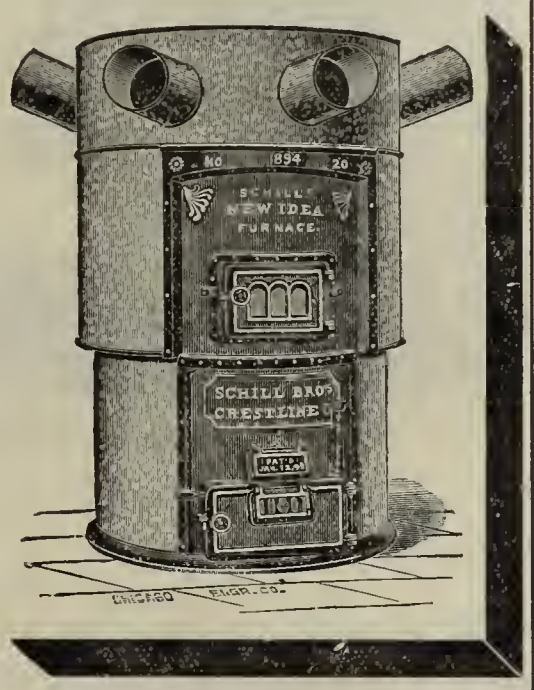
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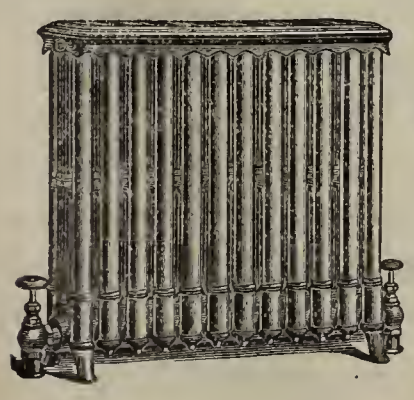
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IN preparing this volume my object has been to produce a book which will not only be useful to students of architecture and engineering, and be convenient for reference by those engaged in the practice of these professions, but which can also be understood by non-professional men who may be interested in the important subjects of which it treats, and hence technical expressions have been avoided as much as possible, and only the simplest formulæ have been employed. It includes all that is practically important of my book on the Principles of Ventilation and Heating, the last edition of which appeared in 1889; but it is substantially a new work, with numerous illustrations of recent practice.

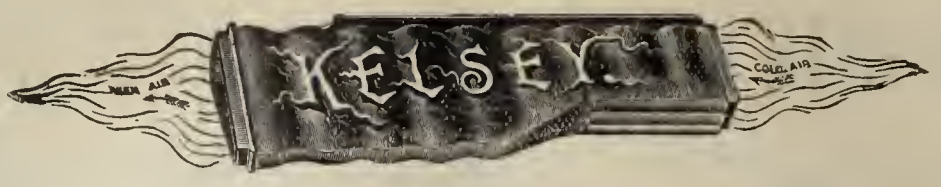
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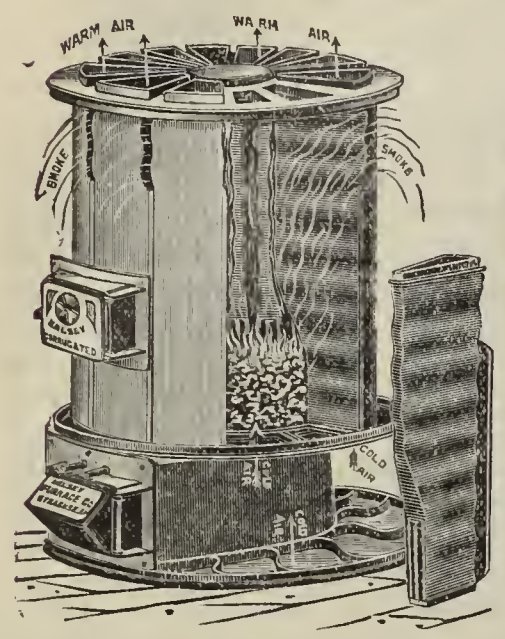
Introduction.—Utility of Ventilation.
History and Literature of Ventilation.
The Atmosphere: Its Chemical and Physical Properties.
Carbonic Acid.
Conditions Which Make Ventilation Desirable or Necessary. Physiology of Respiration. Gaseous and Particulate Impurities of Air. Sewer Air. Soil Air. Dangerous Gases and Dusts in Particular. Occupations or Processes of Manufacture. Drying Rooms.
On Moisture in Air, and Its Relation to Ventilation.
Quantity of Air Required for Ventilation.
On the Forces Concerned in Ventilation.
Examination and Testing of Ventilation.
Methods of Heating. Stoves. Furnaces. Fireplaces. Steam and Hot Water. Thermostats.
Sources of Air Supply. Filtration of Air. Fresh-Air Flues and Inlets. By-passes.
Foul-Air or Upcast Shafts. Cowls. Syphons.
Ventilation of Mines.
Ventilation of Hospitals and Barracks. Barrack Hospitals. Hospitals for Contagious Diseases. Blegdams Hospital. U. S. Army Hospitals. Cambridge Hospital. Hazleton Hospital. Barnes Hospital. New York Hospital. Johns Hopkins Hospital. Hamburg Hospital. Insane Asylums. Barracks.
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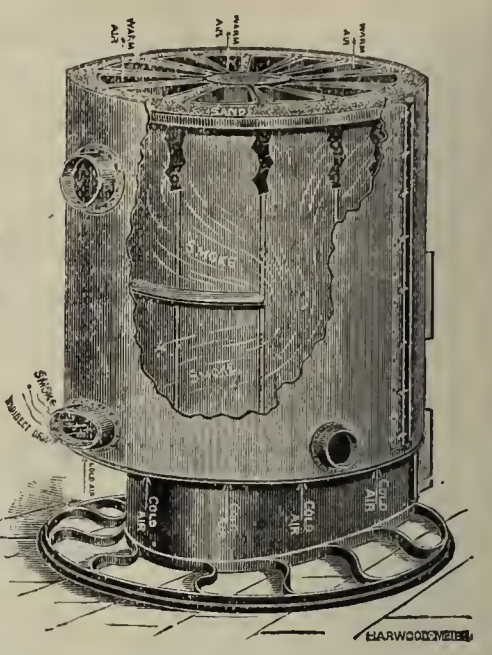


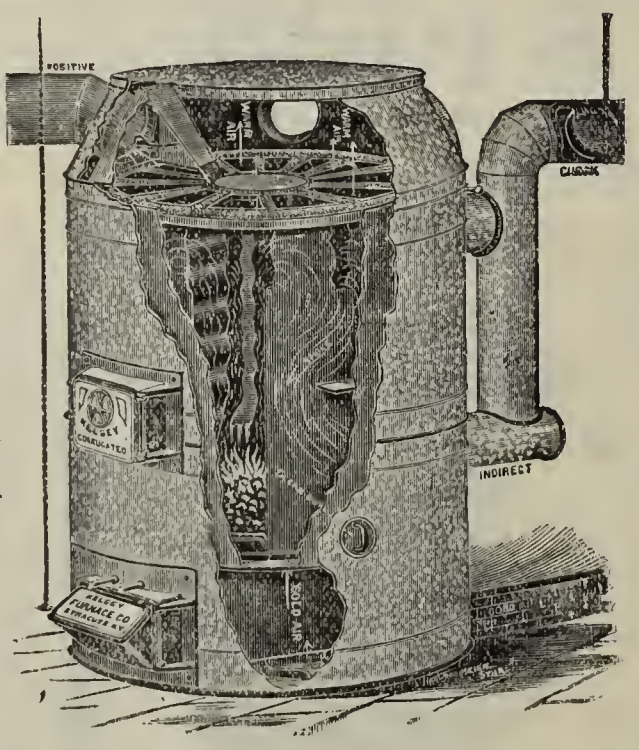


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GAS TIGHT.
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POSITIVE CIRCULATION OF HOT AIR TO ANY ROOM
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Tinning, Plumbing, Gas and Steam Fitting.

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Gentlemen —Answering yours of yesterday, it is only a pleasure for me to state the facts regarding my success with your furnace. This is the fifth year I have handled your furnace and now have 78 in active operation here, placed 29 last year and during the same period do not know of but three of all other makes located here. Every user of the Kelsey is delighted with their furnace and it is the universal satisfaction of all my customers that so much aids in increasing my sales. In the five years' service of your furnace here I have not replaced a single defective part or made one dollar of repairs on a furnace except the occasional replacing of a grate bar. I have handled several other makes of furnaces, but have never seen one so universally satisfactory and requiring less expense for repairs than the Kelsey.

Very truly yours,

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SOFT COAL FURNACES.

Read what our customers say. The wise dealer in the soft coal sections of our country will investigate and secure the agency.

We invite your attention to the following extract from the Beatrice Daily Express of Beatrice, Nebraska, of December 1st, 1893:

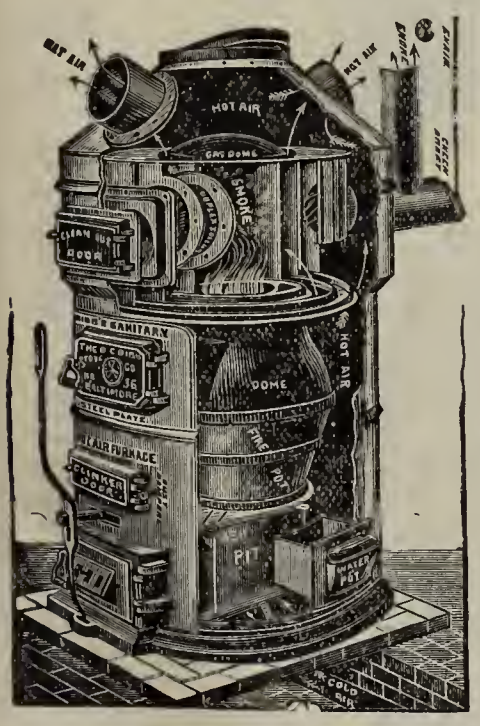
A SUCCESSFUL FURNACE.

Messrs. Crump & Dix have recently placed in the elegant new residence of Mrs. A. J. Hale a Kernan furnace of the smoke consuming design.

Probably there could have been no better test of the heating qualities of a furnace than the weather of yesterday. The average temperature out of doors was 4 degrees above zero and a stormy Northwest wind was blowing nearly all day. There are twelve rooms in the Hale house, all of which are heated by the furnace, and a mean average temperature of 84 degrees was maintained in the house. The fuel used in the furnace is a cheap grade of soft coal, $3.50 per ton. An examination of the top of the house showed it to be perfectly **free from soot,** which affirms the smoke consuming qualities of the furnace.

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Manufacturers of

THE BIBB SANITARY
HOT AIR FURNACE.

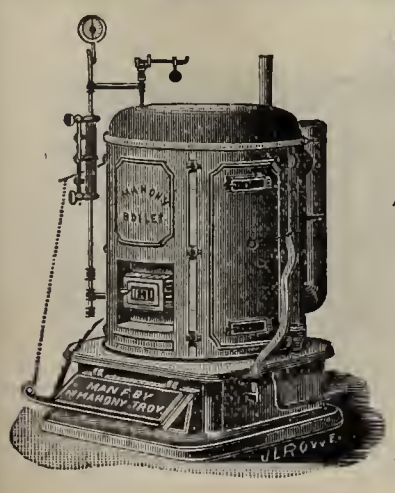
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The arrangement for shaking and dumping the grate surpasses all others—no opening of doors necessary; also

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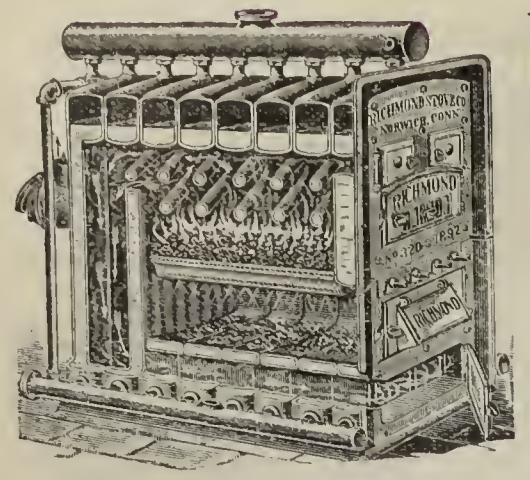
M. MAHONY, - Troy, N. Y.

Garbage Disposal.

Bartow A. Ulrich of Chicago has just laid before Controller Fitch of New York City the result of recent investigations made in England as to the best method for cremating city garbage, a question that is becoming a pressing one in New York and other great cities of the United States. The following facts relating to the systems pursued in two of the suburban towns of London are extracted as containing some interesting information on this point: In Ealing, near London—population 25,000—the refuse is burned, fine coke being used for fuel. About one chaldron a day was consumed at a cost of about 12 cents. The destructor, fume cremator and chimney cost about $10,000. Besides the town's refuse, the sewage sludge, which is mixed with the ashes and burned together, is totally consumed. The quantity consumed in a year there is about 6120 tons. They also utilize the heat and supply steam for an engine which drives the lime mixing machines and clay mixer for the sewage part of the work, operates the pump, chain pump and mortar mill. All the clinker is used in road making, making mortar and artificial stone for paving, and the like. The cost of treating the sewage and house refuse is 18 cents a ton. In another place, Battersea, near London—population 150,000—the crematory, finished in February six years ago, cost $55,000 and consumes 28,000 tons a year. The fires are banked on Sundays. There has been no complaint of nuisance from the burning refuse. The residuum is used for paving.

— HAD BEEN THERE.—Teacher: "Now Robbie, take four slices of cake from six slices, and what will there be left?"

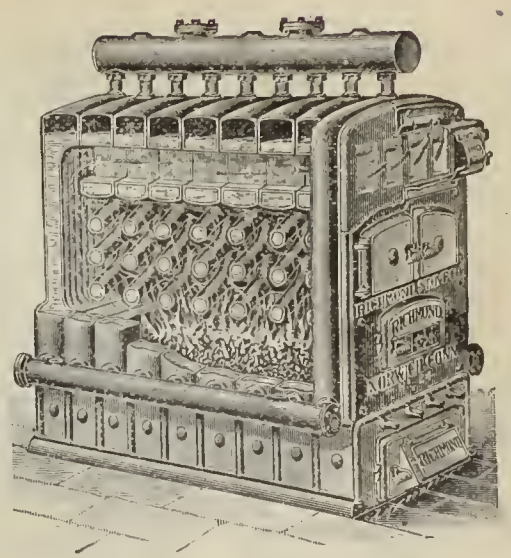
Robbie: "A lickin' for me."



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Steam and Hot Water.

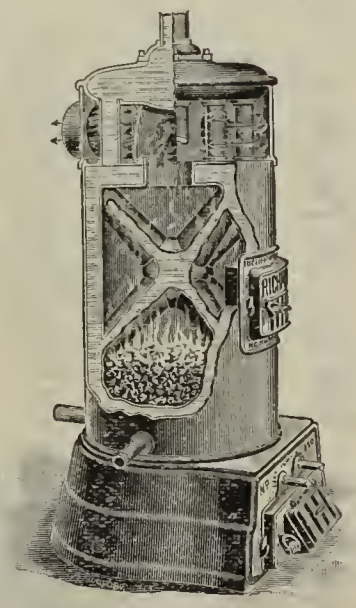


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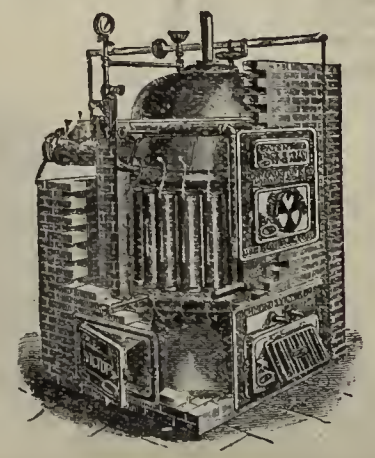
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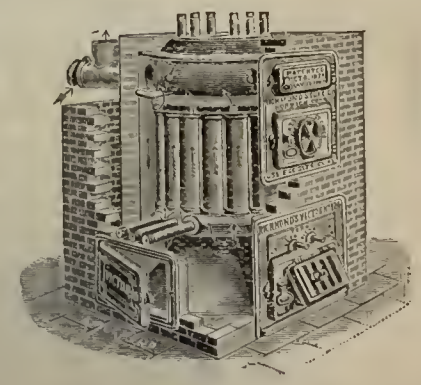
Protection in Terms AND Territory.

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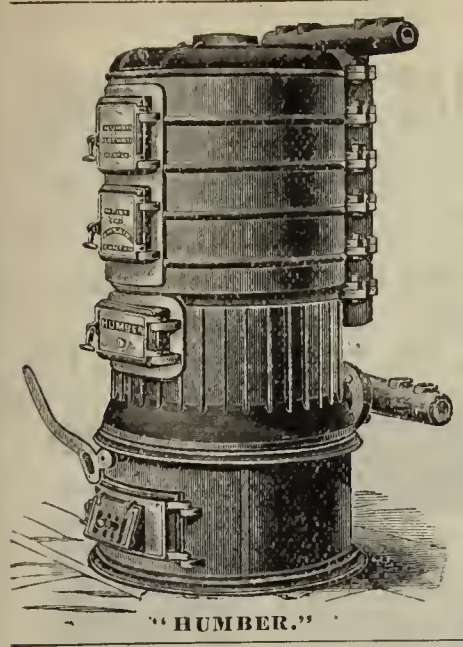
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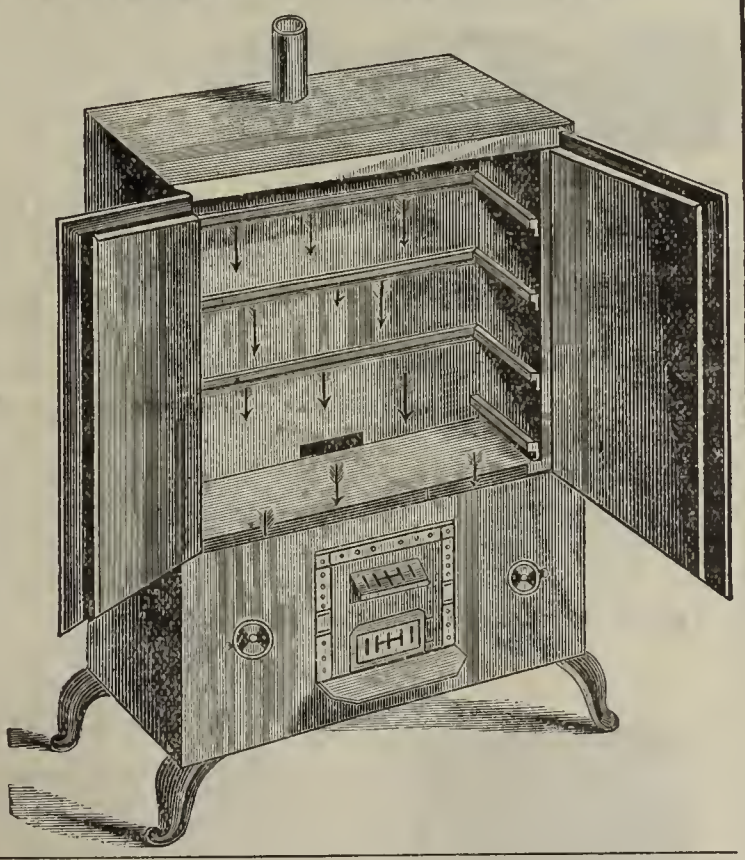
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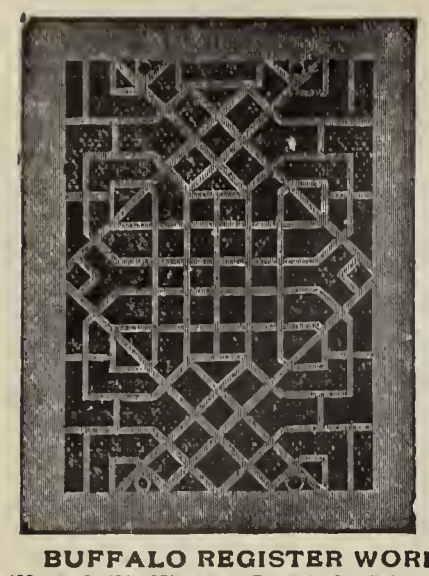
Fire Resisting Glass.

An interesting test of fire resisting materials and construction, says an exchange, was recently carried out in Berlin, under the auspices of the fire brigade and the insurance companies of the city. The idea of the tests was mooted as far back as 1889, but there was considerable difficulty in arranging for a series of "fires," which were intended to be as "natural" as possible, and yet should not be dangerous. Finally, the municipality gave the experimenters the use of an old warehouse for their purpose, and this building, having been fitted up to represent various types of fire resisting structures, was duly set on fire. Care was taken to subject the exhibits to the temperatures, irregularities of heating, sudden shocks by falling weights or jets of water, &c., which generally occur at conflagrations, and it was found possible to take fairly exact observations. Among the most satisfactory results obtained were with the fire resisting glass made by Messrs. Siemens of Dresden. The assessors declare it to be most suitable for any skylight or window necessary in a division between separate risks, as it will resist a temperature of 1300° C. (2372° F.) for half an hour and more, bearing all manner of shocks and strains without suffering appreciable damage. Care is required in fixing this glass, however, as the iron frames generally used for the purpose buckle under heat and show, between the glass and iron, openings through which flame can pass. Some of the so-called fire proof floors made of iron girders and concrete came to speedy grief in these tests; while iron and brick floors stood very well, as did the "Monier" construction. As regards fire proof doors, nothing stood better than double oak covered with thin sheet iron, between which and the wood there should be a layer of asbestos cloth. Seeing how many warehouse fires are propagated through windows, the assessors attach great importance to their demonstration of the capability of Siemens glass for withstanding flame.

— IN THE OLD DAYS.—Belle: "I was supremely happy the day I was 16."

Blanche: "No doubt. I've always insisted that the last generation enjoyed themselves much more than the present."—*New York Sun.*

—"WHERE's the best place for quail in these parts?" asked the stranger who was on a hunting tour. And the man whom he had been regarding as a simple, guileless rustic responded briefly: "Toast."—*Washington Star.*



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Burning Refuse to Generate Electricity.

There are now 55 towns and cities in England, says the *Inventive Age*, which destroy their garbage and solid refuse by burning, and 570 furnaces are employed for this purpose. This combustion is used for generating steam to light towns by electricity, and from the success of the tests which have already been made in this direction many cities are contemplating the reduction of municipal expenses in this way. Improved systems of burning refuse are being proposed, and the latest of these, the Livet method, has been satisfactorily tested in England before a number of engineering and city sanitary experts. The average quantity of rubbish burned per hour on each square foot of grate surface was 331 pounds, and four separate tests made in the presence of independent engineers showed that 4.08 pounds of water were evaporated per pound of rubbish consumed. The refuse of the city of London is estimated to produce by this process over 87,818 indicated horse-power, at a total cost of $707,495, whereas the cost with the best Lancashire boiler, burning coal and evaporating 10 pounds of water per pound of coal, would be $3,995,715.



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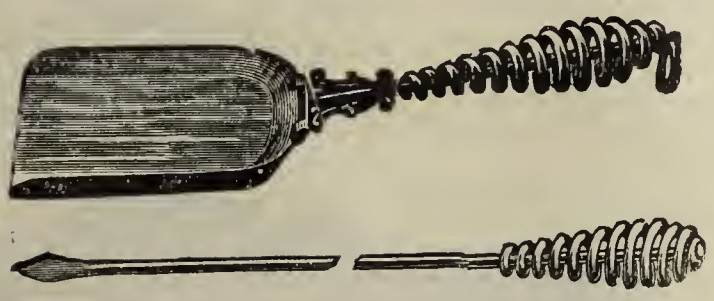
as they hold the heat back, retaining it just where it is wanted, with no smoke or gas in the room, saving 25 per cent in fuel.

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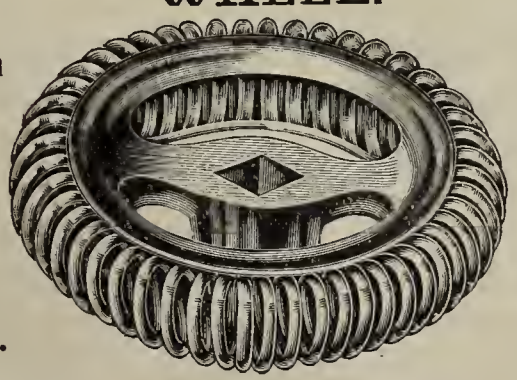
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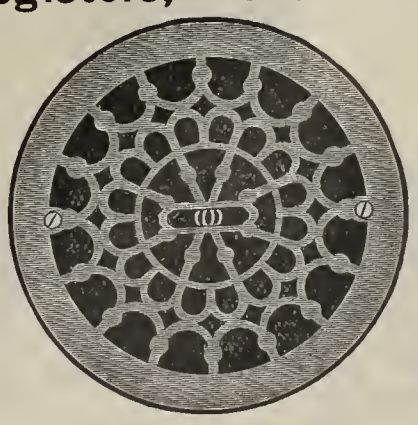
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No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8⅛ inches. Size of Tank, 3⅛x5⅛ inches. NICKEL FRONT. Four-inch wick.

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There are no old relics or fossils in the B. & B. line.

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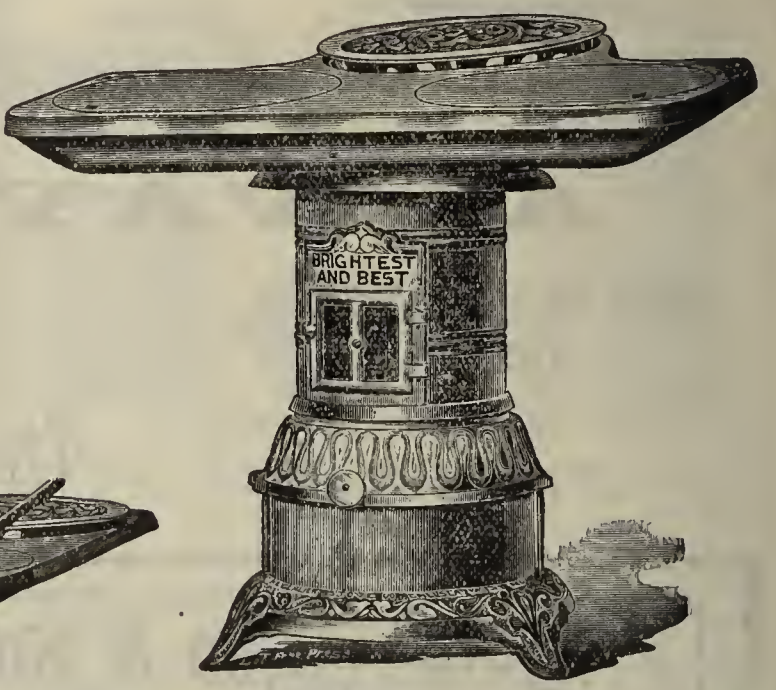
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List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozen in box. Weight, 85 pounds. Height, 8½ inches. Size of Tank, 5½x5¾. NICKEL FRONT. Two 4-inch wicks.



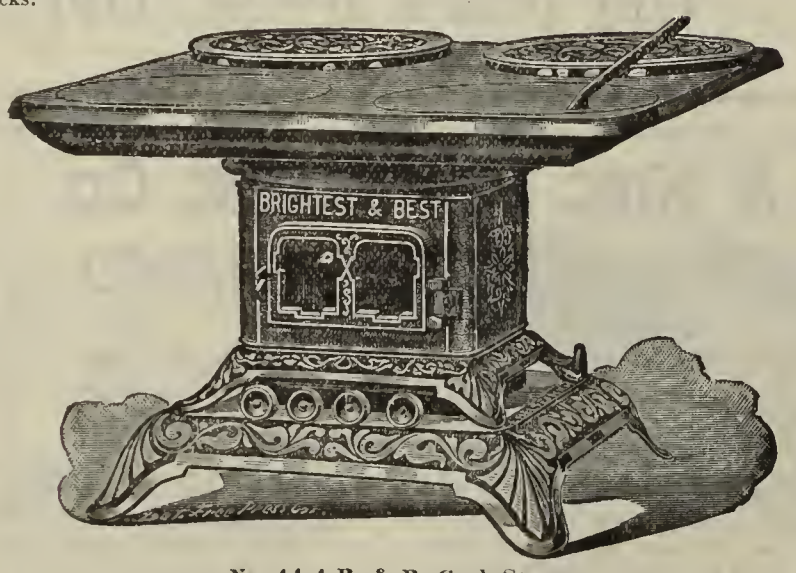
No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozeu. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8⅛ inches. Size of Tank, 5⅛ x 8½ inches. NICKEL FRONT. Three 4-inch wicks.



No. 6–3 B. & B. Cook Stove.

Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.

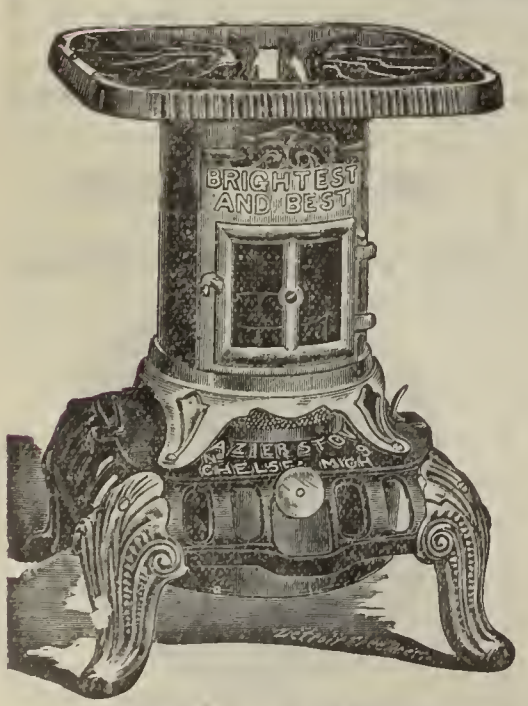


No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four boles for 8-inch ware. Four 4-inch flat wicks.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

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THE METAL WORKER.

NEW YORK AND CHICAGO.

Saturday, June 16, 1894.

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Vagaries of Weather.

A subject in which everybody is interested, without distinction of station or occupation, is *the weather*. Upon this, each day, all persons make some reflection. Like food, it is a fundamental factor of human existence, for even the supply of food is largely dependent upon its conditions. Thus it is that the weather reports and predictions now form an important and staple item of daily news. The uncertainties and vagaries of weather have become proverbial. Yet there is nothing more sure than that all its varieties, of which this country has had a rather unusual experience, result from the action of natural laws. As the word "law" implies regularity and uniformity in mode of action, and can mean nothing else, it has puzzled many to understand how such action can result in apparent irregularity. This spring we had first a continued period of dry weather, followed by heavy storms of wind with protracted rainfall, succeeded by late frosts, doing much damage to crops at various points. In these respects the season is regarded as exceptional, yet, in the action of natural laws how can uniformity permit exceptions?

A Puzzling Question Explained.

The answer to the question just put is that in nature all that seems irregular is only so in appearance. If one should trace with a pencil a mark say ½ inch long, making it as irregular as possible, and then exactly reproduce this mark, connecting it with the first, and so on with the third and fourth mark, that which at first seemed entirely irregular will soon appear to obey a law of uniformity. A regular recurrence of anything, considered as part of a whole, establishes a law of repetition. There are many reasons to believe that if observation of weather could be extended over sufficiently long periods a law of repetition could be deduced from systematic records of such observation. If such a law could be established, conditions of weather might be predicted with as great certainty as the return of a comet moving in a regular orbit. But it remains possible that such a law of recurrence, if it exist, may comprise cycles of time so great as to be comparable only with geological periods, lapses of time so vast that human records could not be preserved from their beginning to their termination. If this be true, while it does not conflict with the proposition that a law of uniformity governs weather, like everything else in nature, it implies that the law can never be definitely stated and will forever remain hidden from human intelligence.

The Anarchistic Strikers

Insurrections of more or less magnitude have broken out in 12 States. If they were due to political causes the whole country would be in a ferment. As they are merely demonstrations by striking workingmen, excitement runs high in the immediate localities affected and diminishes rapidly as the distance increases. Yet in nearly all these States it has been found necessary to call out the militia to check the commission of unlawful acts by bodies of men too large to be successfully handled by local authorities. The reports printed in the daily press read like bulletins from battle fields. Bloody engagements take place, lives are sacrificed, property is destroyed and the "horrid front" of war has become a vivid reality in too many places. Strikers defy the law and resort to the most desperate deeds of violence in a mad fury. They seem to have broken loose from all restraints and cannot be controlled by their leaders. These labor officials in their public utterances counsel peaceful methods, but they have evoked a demon who refuses to be confined and mocks their feeble efforts at restraint. In the wide organization of labor unions a new species of government has been formed, which is in direct antagonism to the form of government established by the people, and the conflict now precipitated must decide who shall hereafter be our rulers.

Enforcement of Law.

When the coal miners' strike began the sympathy of the public was overwhelmingly in their favor. The advantages of cheap fuel were scorned when it was found that such cheapness was the result of scanty wages paid to miners. Even coal operators themselves conceded the justice of miners' claims and professed their willingness to advance wages in quite a number of localities if competing operators would do the same. Enough of them at one time were ready to settle the dispute to have given the miners a great victory, which could then probably have been extended over the entire coal country. But the obstinacy of the leaders in refusing partial settlements and demanding a national adjustment changed the whole aspect of affairs. To hasten a coal famine desperate means were adopted by the miners. And now public sympathy has changed. The friends of the miners are deserting them. The press, without regard to politics, demands that the law shall be respected, that the movement of coal trains shall not be interfered with, that coal property shall not be destroyed, that miners who desire to work shall not be molested and that those who are in arms against the constituted authorities shall be treated as rebels. There is no longer any question of high or low wages for miners. The only question to be settled now is whether any body of men are to be permitted to establish a government of force in this land of liberty.

The Fire Island Light, one of the most important beacons on the coast, is about to be improved by the substitution of electricity for oil in its illumination. The new light that is to be installed is said to have the power of 25,000,000 candles. It was exhibited at the World's Fair, where it was known as the "lightning light." It has a bivalve lens. The two sides are about 9 feet in diameter. Each lens is made up of many crystal prisms set in a network of brass, the prisms concentrating the light on a crystal disk in the center. The lighthouse on Fire Island is 168 feet high, and it is estimated that the new light will be seen for 25 miles. It will be the greatest light on the coast of this continent.

In describing the present industrial situation in New England, the Boston *Transcript* says that a number of the mills are now being run not for the profit there is in the business nor simply to keep the men at work, but because the managers find there is a slight difference in expense account between running them at a loss and letting them remain idle. The manager of the Manchester Print Works, for example, believes in running the mills so long as the loss is less than 25 per cent. In other words, the expense of maintenance of idle mills is 25 per cent. of the actual cost of running, and as long as the loss in manufacturing goods falls below this 25 per cent. the mills will be run.

The Massachusetts Legislature has passed a bill authorizing the increase of the stock of the Bell Telephone Company to $50,000,000, with an amendment that the capital stock shall be paid for in cash.

THE LETTER BOX.

Marine Bicycle.

From R. B., *Lynn Valley, Ont.*—I am working on a water bicycle and have been referred to you for information about the valves. I intend having two tin tubes, tapering at both ends like a round bottom boat, with the top flat enough to fasten the boards to, for holding them together. The length of tubes is to be between 8 and 10 feet. The machine, 3 feet 6 inches in width, will be run by two paddle wheels, one ahead and the other in the center. I want the floats to hold from 200 to 225 pounds, to allow for the rider and the fixings. What should be the circumference of the floats?

Answer.—The floating part of the bicycle is in reality a catamaran, and we presume our correspondent expects to have the floats about half submerged. In other words, the two cylinders would then, if submerged half their depth, support the same quantity as one of the cylinders completely submerged. Assuming the length of cylinders to be 10 feet, and not making allowance for the taper of the ends, since we do not know exactly what the shape will be, it remains to find what diameter of cylinder 10 feet in length would hold 225 pounds of water. Consulting the tables, we find that a pipe 8¼ inches in diameter, 1 foot long, contains 23.1 pounds of water, so that a pipe 10 feet long contains 231 pounds of water. According to this figuring, therefore, if our correspondent makes his cylinders 8¼ inches in diameter and 10 feet long they will support 231 pounds when submerged half way. This, it must be remembered, makes no allowance for the weight of the cylinders, but we presume that was figured in the 225 pounds. It further assumes that the ends of the cylinders are square, so that it would be well to make the diameter a trifle larger to allow for the pointing at the end of the cylinders, if we are to assume that 10 feet is the length over all. If our correspondent is interested in figuring it out in another way it can be done in this fashion: A cubic foot of water weighs 62¼ pounds. Therefore he will have to displace 3.61 cubic feet of water to support 225 pounds. That assumes the length of the cylinder to be 10 feet totally submerged. For 1 foot of length, therefore, the cylinder will have to contain 0.361 cubic foot. We don't suppose our correspondent is specially interested in the successive steps of this calculation. Suffice it to say, therefore, that from these figures we deduce that a cylinder should be 8.14 inches in diameter to support the proposed weight. This is a little less than the 8¼ inches above given, but the latter figure, as stated, was for a weight of 231 pounds. We give the second calculation to show how it checked the first. We presume if our correspondent makes his cylinders 8¼ inches in diameter they will prove suitable for his purpose.

Proposed Package for Tin Plates.

From L. B. D., *Spring Hill, N. S.*—I notice in *The Metal Worker* of May 26 a communication from A. L. Burtis, Lockport, N. Y., relating to an improved package for tin plates. The idea of circular package is to my mind an improvement, but I fear that sheet iron for a covering is objectionable for the reason that a blow or fall upon the casing would dent it and leave an impression on the tin, which would thus be damaged. If the sheet iron casings were lined with wood of some light strong quality it would be better; or, why not have boxes similar to cheese boxes or something of that general kind? Then the box might be packed in the same way that zinc is packed in casks, the space being all utilized so that there would be no hollow core. I hope to see Mr. Burtis' plan for improved package carried out.

Steel Furnace Dome.

From R BIGLEY, 96 *Queen street, Toronto, Canada.*—Will *The Metal Worker* give me the address of some manufacturer of steel domes for hot air furnaces? I have looked for advertisements of these goods, but have found none.

Note.—We have given the full address of this correspondent in order that manufacturers of such goods may communicate direct. Hepe, Koven & Co., 18 Spruce street, New York, make a specialty of goods of this cha acter.

Coppersmiths' Tools Wanted.

From JOHN FULLER, SR., *Seneca, Kan.*—Since my articles on coppersmithing appeared in *The Metal Worker*, and their republication in book form, I have received a number of letters from different parts of the country inquiring where the tools illustrated are made or can be bought. I have exhausted all the means at my command endeavoring to supply the information sought, but without success. Now, it would seem there is demand enough for these tools to warrant those manufacturing similar goods to make an effort to supply them, particularly hammers. I had a few brought from England a short time ago for my own use, because I could find none in America, but they were poor things, and not to be compared with those usually found in the old shops I have worked in. We ought to be able to get these things somewhere in America. If this should catch the eye of any one in the trade who can and will kindly give us the address of some maker or dealer in these tools, they would confer a great favor on many readers interested. It would be well, however, to say here that the ordinary method of making and hardening hammers is not suitable or satisfactory for brazi'ers' or coppersmiths' tools. I mention this by way of caution, so that those who might be inclined to make an attempt may avoid failure at the outset and be reasonably successful from the beginning; ordinary tinners' tools, or tools made in the same way, are no use to us.

Boiler Surface and Radiation.

From C. W., *Paterson, N. J.*—Will *The Metal Worker* please inform me how many square feet of radiation can be carried by 1 square foot of heating surface in a horizontal tubular boiler?

Answer.—Our correspondent does not state whether the boiler is to be used for steam or hot water heating, and without more details only an approximation can be given. A conservative estimate that will probably give the desired information is that 1 square foot of boiler surface will carry from 8 to 12 square feet of hot water radiation and from 4 to 6 square feet of steam radiation. As a horizontal tubular boiler is generally considered a good type of boiler for heating, it is quite possible that it would carry the larger amount given.

Problem in Drainage.

From S. H., *Union Hill, N. J.*—In response to the query of "M. J. F." of Minersville, Pa., in *The Metal Worker* of June 9, in regard to the draining of his cellar into a creek, if the creek be a tidal stream I would suggest that he put in a back water valve, which would prevent the water from backing up at high tide and allow it to pass off at low tide. But if the creek be an inland stream, the rise of 2 feet which he mentions would no doubt be caused by the spring freshets and last some time, giving the water a chance to accumulate in the cellar. The valve alone therefore would not do. In that case he might put in an automatic cellar drainer, worked by water pressure, connecting the discharge from same on the further side of the back water valve. This would insure him a dry cellar. He certainly cannot depend on the velocity of the current to siphon out his cellar.

Capacity of Square Cans.

From J. H., *Baltimore, Md.*—Please inform me what size of square tin cans will it take to hold about 100 gallons each? They are to put in a wagon about 4 feet wide, and I would not want them more than 2 feet high.

Answer.—Starting with the basis of 2 feet hight, the size of the cans to hold exactly 100 gallons would be 31.02 inches on the side. Cans 31¼ inches square and 2 feet high will hold 101.4 gallons, which will probably be near enough for our correspondent's purpose.

New Process Oil Heater.

The Standard Lighting Company of Cleveland, Ohio, have placed upon the market a heater known as the New Process, and intended for burning coal oil as a fuel. It is constructed with a brass font, nickel trimmed, and a Russia iron drum with ornamental top, which can be removed in order to use the grate for cooking purposes. The accompanying illustration represents a general view of the heater with the top in position. The manufacturers refer to the



New Process Oil Heater.

construction of parts as simple and as easy to keep clean. The company make use of their Mammoth Globe incandescent lamp with a special attachment on the spreader, which, with the drum, can be readily removed, the spreader changed, a glass chimney placed in position and the heater is at once converted into a 300 candle power Globe incandescent lamp. This heater is intended more especially for use in bedrooms, bathrooms, offices and other places where a moderate heat is required without a flue connection.

The Cowper-Coles Cold Galvanizing Process.

The electro deposition of zinc has been the subject of many patents, but the process was found to be too slow and costly, and the deposit obtained porous. Mr. Cowper-Coles claims that his method of deposition entirely overcomes these difficulties. The engravings, which are from the *Engineer* of London, show the arrangement of a plant recently erected by Watson, Laidlaw & Co., at Glasgow. The articles to be zincked, if thickly coated with grease, are passed through the "potash boil," which is kept at a temperature of about 200° F. by means of a copper steam coil, the solution consisting of 1 pound of American potash to the gallon of water. The articles are then placed in the pickling tank, which contains a weak solution of sulphuric acid and water, kept circulating by a steam jacketed pipe outside the tank, as shown on the plan. The articles are then placed in the washing tank and allowed to remain there until they are required for zincking.

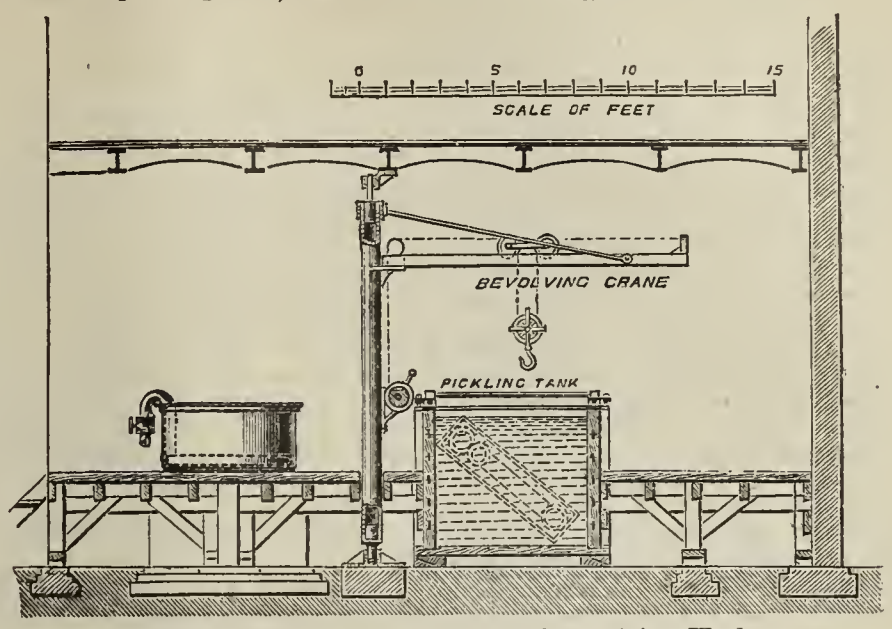


Fig. 1.—Vertical Section of Electro Galvanizing Works.

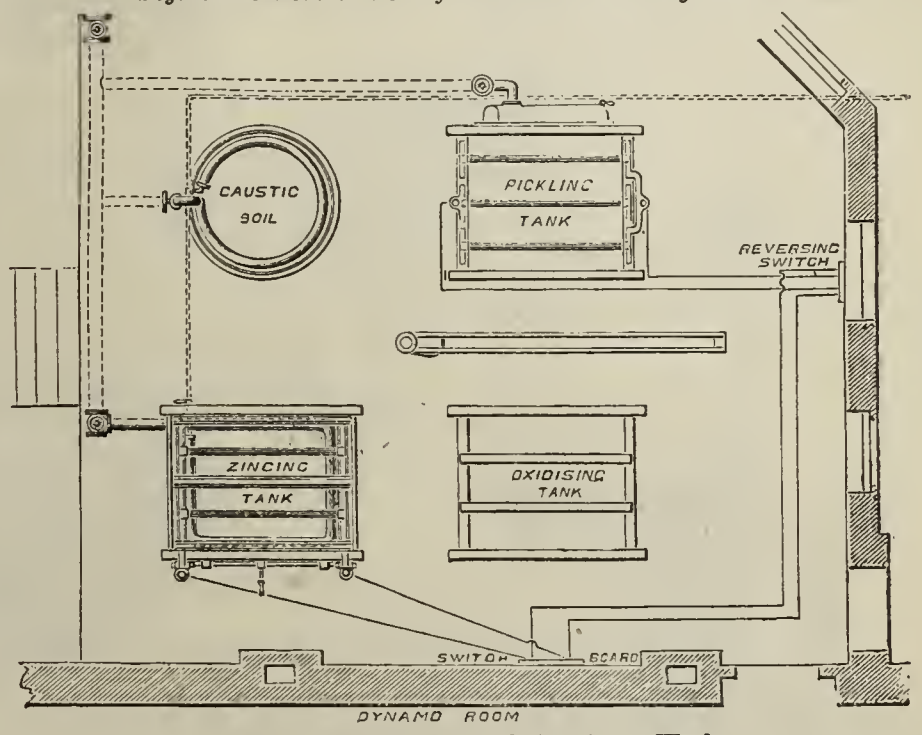
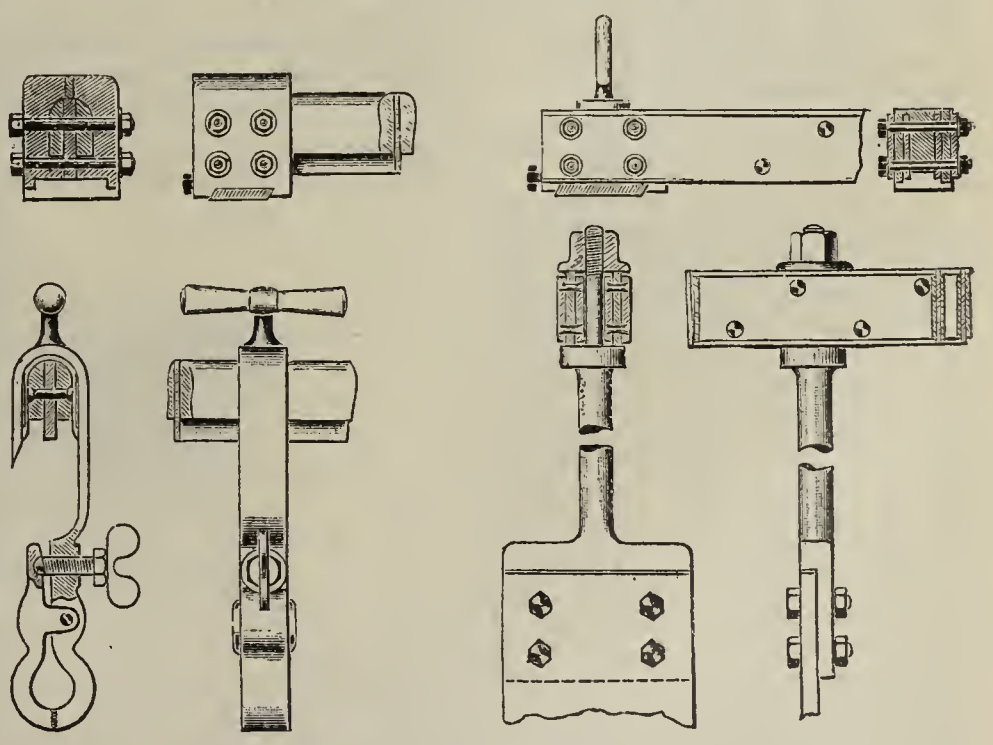


Fig. 2.—Plan of Electro Galvanizing Works.



Figs. 3 to 6.—Anode and Cathode Suspension Bars.

THE COWPER-COLES COLD GALVANIZING PROCESS.

Figs. 3 to 6 illustrate the arrangements of the anode and cathode suspension bars, which are designed to carry 800 ampères each, the total output of

the dynamo being 2500 at 5 volts. A current density of 50 amperes per square foot is employed at the electrodes. The current is conveyed from the dynamo to the zincking bath by two cotton covered cables, having a total sectional area of 2½ inches. Each cable contains 16,800 No. 33 S.W.G. wires made up into 20 strands. The cathodes —that is, the articles being zincked—are suspended on compound copper and steel suspension bars, which rest on a rocking frame to which is imparted a horizontal and vertical motion by means of a hand lever and roller paths, as shown below; the roller paths have a rise of 1 inch in 3 inches. The structure of the compound conductor suspending bars is shown clearly in Figs. 3 to 6 above, and the arrangements for connecting up and for limiting the rocking are shown below. One of the special features of Cowper-Coles' process is the addition of zinc fume or powder to the electrolyte. The zinc dust is readily kept in suspension, as the solution employed is very dense. The addition of the zinc fume enables more than the theoretical deposit to be obtained under favorable conditions, and overcomes almost all the difficulties appertaining to the electro deposition of zinc. The zinc powder employed is obtained direct by the process of distillation from the ore.

The thickness of the zinc coat, says *Industries* of London, applied by dipping the articles to be galvanized in a bath of molten zinc can be varied only within very narrow limits, except in the case of thin plates, which can have the excess of zinc squeezed off by rollers when leaving the bath. The cold galvanizing process allows of the thickness of zinc coat being readily varied from a few grains per square foot to 1½ ounces, which is a matter of some importance, as for many classes of work it is not desirable to have more than ½ ounce of zinc to the square foot. Another advantage of the cold process is that a much smoother surface and a more equal distribution of the zinc is obtained than is possible by the ordinary hot galvanizing. This renders the new process especially suitable for coating the plates of the hulls of fast vessels, such as torpedo boat destroyers. As pointed out by Sir Gabriel Stokes, in addition to the element of resistance depending on the formation of waves continually propagated away from the ship, there is the effect of retardation due to the roughness of a ship's bottom out of all proportions to the mere increase of virtual dimensions, which is explained by the consideration that the little roughnesses form the birthplace of eddies.

The time in the zinc plating bath is as follows :

Table of Time.

Weight of zinc required.		Thickness of coating.	Time of immersion in bath.
Per superficial foot.	Per superficial yard.		
Ounces.	Ounces.	Inch.	Minutes.
½	4½	0.000861	5
¾	6¾	0.001291	7
1	9	0.001722	8
1¼	11¼	0.002152	10
1½	13½	0.002583	13
1¾	15¾	0.003013	17
2	18	0.003444	20

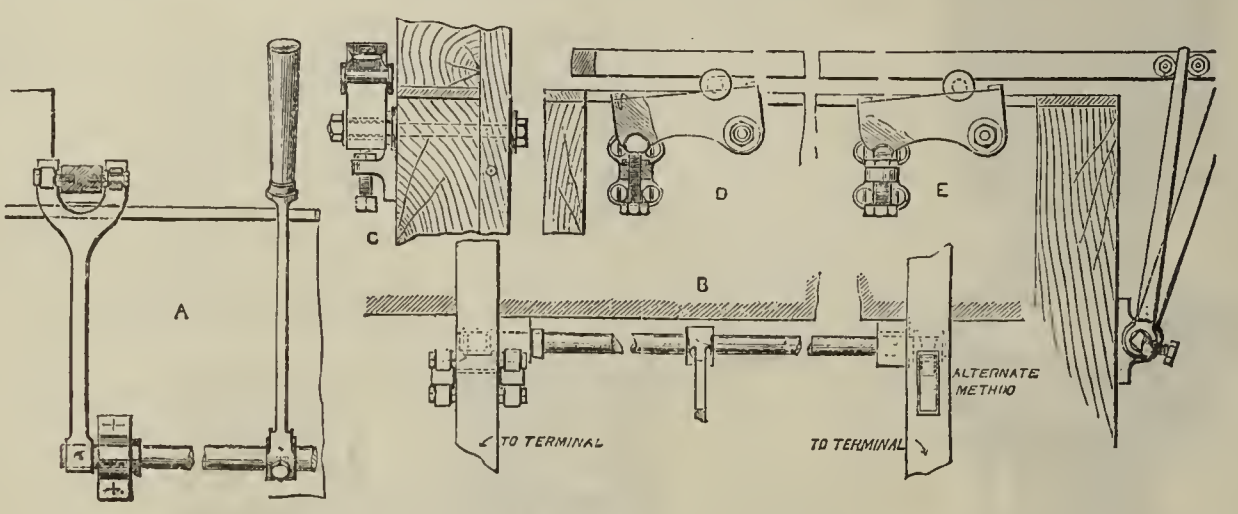
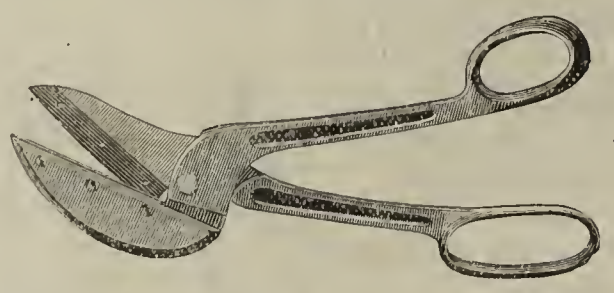


Fig. 7.—Cathode Bar Suspenders and Rocking Frame.

THE COWPER-COLES COLD GALVANIZING PROCESS.

The Lobl Tinners' Shears.

We show in the accompanying illustration a general view of the Lobl shears, a tool intended for roofers, tinners, cornice makers, &c., and made by Eugene Kulinski & Co., 91–93 Thompson street, New York. The peculiar shape of the blades will be noticed, and the special feature of the shears is the method of pivoting them, so that a slot permits the metal to be run straight back as it is cut, and thus the metal does not require straightening after cutting. It is further pointed out that these shears will cut corner shaped strips or leaders, &c., of metal as heavy as No. 24 iron or soft steel. The shears are made of steel throughout, with removable blades, so that they are easily sharpened. The Lobl shears are made in two sizes, No. 14 being 14 inches long, with jaws 4 inches in length, and weighs 2 pounds. No. 2 is 15½ inches long, 4½-inch jaws and 2½ pounds in weight.



The Lobl Tinners' Shears.

Molders' Leather Fillet.

The engraving here presented represents a new form of leather fillet made by the Diamond Clamp & Flask Works



Molders' Leather Fillet.

of Richmond, Ind. The sides of A B are cut curving, as shown, instead of straight. When the point at the intersection of the lines A B is forced into a square corner the side C assumes a curve, as indicated by the dotted line. This construction saves the time of cutting and preserves the surface of the leather, the exposed side C being the hair side.

Because some imported Italian marble mantelpieces had been received for the new mansion of Elbridge T. Gerry in this city, all the workmen employed in the building, including plasterers, carpenters, plumbers, tile layers, electric wire men and iron workers, quit work recently, by order of the Building Trades Union. The unreasonable tyranny of organized labor was never more strikingly exemplified. More than $10,000 have been already paid to American workmen employed on the building for interior decorations alone. The union puts its case on the ground of objection to "the use of the products of foreign labor," and the Gerry house has been selected as a test case.

The New York and New Jersey Bridge bill was signed by the President on June 8.

THE RETAIL STORE.

The Dempsey Cutlery Display Case.

The Union Show Case Company, 167 and 169 Randolph street, Chicago, Ill., are manufacturing and placing on the market the Dempsey patent cutlery display cases. These cases contain many features which are unique, novel and withal intensely practical, as shown in the accompanying cuts. The design of the case, the inventor states, is to furnish the trade with a case that meets all requirements with no disadvantages. As seen in Fig. 1, pocket knives to be displayed are arranged in parallel corrugations at an angle of 30° and in three separate horizontal tiers rising one above the other. The larger patterns occupy the base or lower tier, while the smaller and more expensive are placed in the second and third tiers. Rising above the third tier at an angle of 10° and running parallel with the lower tiers is a board for razors, shears or scissors. The background is of blue, red, green or old gold plush. To add still further to the embellishments as well as conveniences, below each tier of patterns displayed and running horizontally is a strip of burnished and lacquered brass, perforated in such a manner as to hold tags on which are printed the number and price of the article immediately above. These price tags are easily detached and can be quickly changed so as to meet all the conditions of the trade. By means of these tags the attention of the purchaser is called not only to an array of glittering blades and handles in a general way, but his attention is directed to individual and particular patterns. They also enable cutlery to be easily marked without marring or soiling.

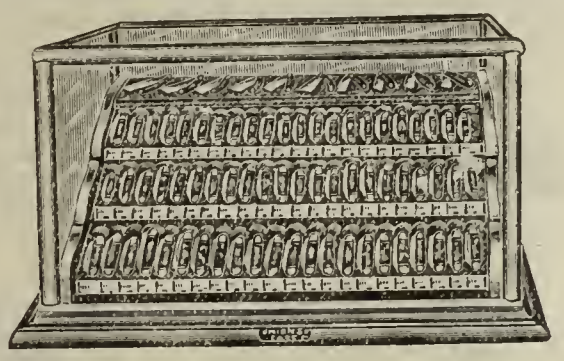


Fig. 1.—The Dempsey Cutlery Display Case.

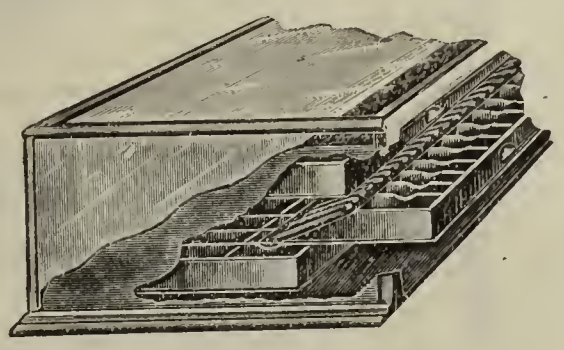


Fig. 2.—Sectional View of the Dempsey Case.

The internal construction of the case will be understood by reference to Fig. 2, which gives a sectional view. Each display tier has compartments for stock which are concealed from view in front, but can be drawn out in the rear like a drawer. By this arrangement the capacity of the case is exactly double that of an ordinary show case. A case 30 inches long carries the stock and displays 66 patterns of pocket knives and one dozen patterns of razors, shears or scissors. The display boards, as seen on the front of the case in Fig. 1, are detachable and may be placed on top of the counter or show case, as shown in Fig. 3, for the closer inspection of the customer. When stock is low, by placing two or more of each kind of knives on the display rack the stock can be made to appear to the purchaser to be quite large, while, on the other hand, if the stock is very large and the dealer is crowded for space it can be contracted by displaying only one of each pattern. Another feature of this case which recommends it to the trade is the fact that it is practically impossible for careless clerks to disarrange the display, or for it ever to appear otherwise than in the best possible condition. Although this case was only patented October 3, 1893, it has been adopted by leading jobbers of cutlery throughout the entire country.

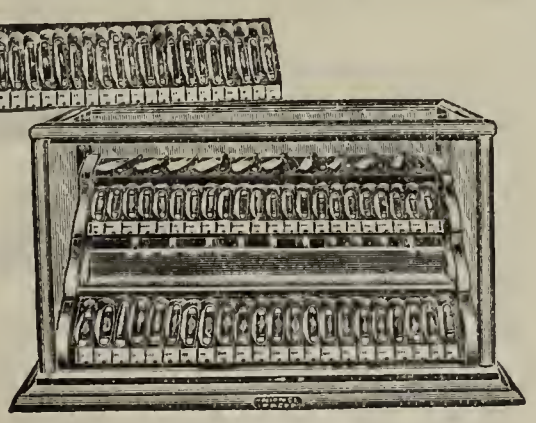
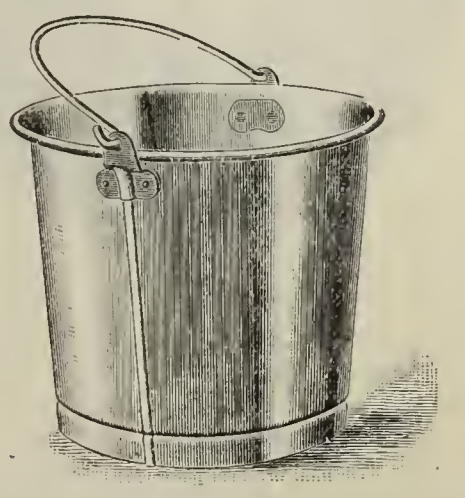


Fig. 3.—Detachable Display Boards.

A New Dairy Pail.

We show in the accompanying illustrations a general view, Fig. 1, of a new dairy pail brought out by the Rochester Stamping Works, Rochester, N. Y.; also, Fig. 2, section through bale ear. The patented feature of the pail is the reinforcement of the ear, as shown in Fig. 2, which consists of a small piece of tin set into a countersink on the inside of the pail directly behind the ear, and all firmly riveted together and securely soldered on the inside, making in



New Dairy Pail.—Fig. 1.—General View of Pail.



Fig. 2.—Section through Ear.

this way an extra strong attachment, perfectly water tight. It is furthermore pointed out that it is impossible for the rivets to work loose or rust out. The patent covering this feature was granted to M. F. Robeson May 15 of this year. The special points of superiority claimed for this pail by the manufacturers are extra heavy wire around the top edge, heavy ears of steel and reinforcement of the ears by extra piece of metal countersunk as described. We understand that these goods are meeting with much success with the trade.

The Ideal Damper.

Stover Mfg. Company, Freeport, Ill., have just taken up the manufacture of dampers, and are introducing the one shown in the accompanying cut. It is explained that the spindle goes in straight, having proper guides, so that it cannot go wrong, and that with a quarter turn it is in place; that the collar is secured to lugs on the spindle, so it cannot slide off when the spindle is taken from the blade, thus saving much annoyance, and that the wooden handle is securely held in place by means of a wire wrapped around the center in a groove, one end of the wire being cast into the head of the spindle, thus becoming a part of it. The point is made that there is a small amount of metal about the handle, and that the handle is securely held and is kept cool. The makers claim that the spindle is sharp pointed and makes its own hole; that the spring and collar are securely attached to the spindle; that no punch or tools are required to put it in place; that it requires but a quarter turn of the spindle to lock or unlock it; that the spindle enters the blade with the handle turned either way, and that the locking lugs on the spindle are sharp and cut their way through the pipe. The dampers are made in regular sizes from 4 to 7 inches.

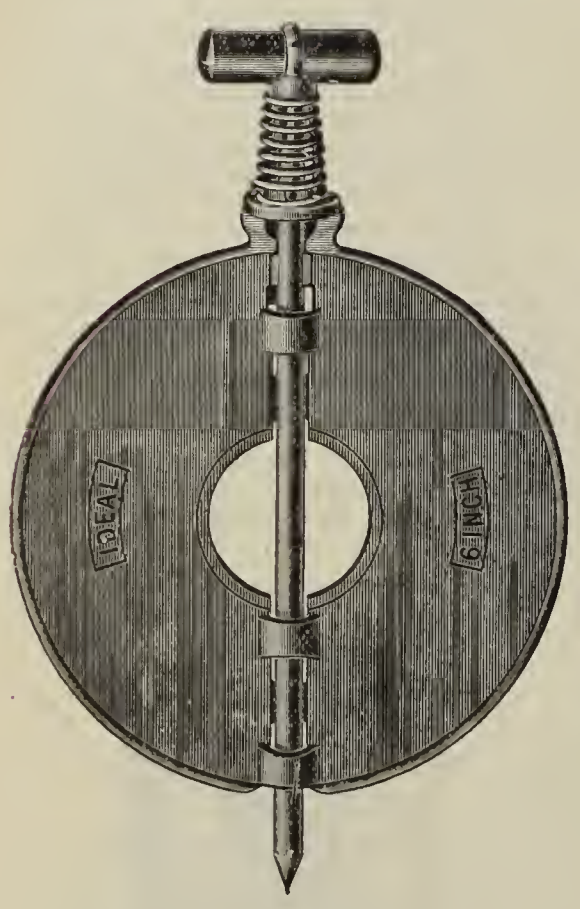


Fig. 1.—The Ideal Damper.



Fig. 2.—Damper Spindle.

Great American Fish Scaler.

Covert's Saddlery Works, Farmer, N. Y., are offering a fish scaler, as shown herewith. The scaler is made of heavy sheet steel, attached to a steel shank, and is nicely finished by being C plated with a non-corrosive metal; it weighs about 3 ounces. The point is made that the rapidity and ease with which scales can be removed with the tool make it a very desirable device for the fish market and the family. Samples are sent by the makers by mail upon receipt of 15 cents.

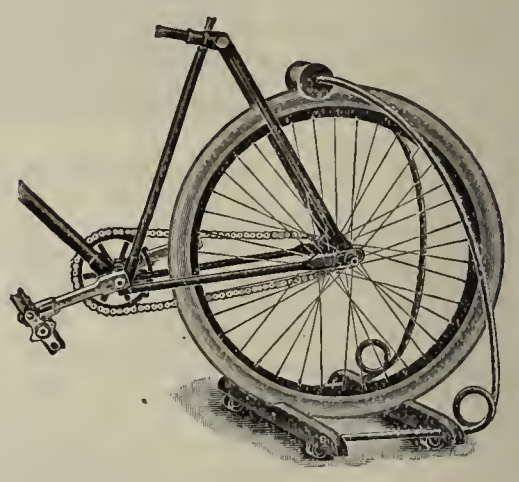


Great American Fish Scaler.

THE JOHN TOBIN MFG. COMPANY, Newark, N. J., are just sending out a 56-page catalogue the front cover of which proclaims them as manufacturers of nickeled and copper urns, planished tin, copper and nickel plated tea and coffee pots, spun goods and sheet metal specialties. A note to the trade states "we are direct producers of every article in this list" and that "several new and useful articles have been added to our assortment." Several pages are devoted to urns, which are made either porcelain or tin lined and in various sizes and shapes or to special order. These are followed by planished soup tureens, farina and rice boilers, tea kettles, chafing dishes and nickeled and copper beer and ale measures, funnels and mixers. Then several pages are devoted to coffee and tea pots and urns, among which are the Best, with textile filter; the Aroma, Superior and Boss, and Boss urns. These are followed by butter kettles, jelly molds, saucepans, dippers, coffee flasks, gravy strainers and brass, copper, tin and zinc oilers. They also make a line of trimmings, breasts, covers, handles and spouts of tin and copper for tea and coffee pots, and a line of animal, leaf and other cake and biscuit cutters.

The Bridgeport Bicycle Stand.

Lyon & Grumman, Bridgeport, Conn., are putting on the market a bicycle stand, as here shown. The device consists of two cross bars of wood, which may lie flat on the floor or be mounted on casters, through which run $\frac{5}{8}$-inch steel wire. This is coiled to form a spring and then carried up to the hight of the bicycle wheel and across and down on the other side. The bottom of the wheel rests in grooves in the wood cross pieces and the top is held by a grooved spool through which the wire runs. This arrangement, it is stated, holds the bicycle upright and firm even when mounted, and permits easy movement of the machine either together with the stand or alone. The manufacturers claim that the stand is simple in construction, manufactured in the best manner and that it weighs but 4 pounds.



The Bridgeport Bicycle Stand.

Improved Sad Iron Handle.

The Cleveland Wood Turning Company, 710 to 726 Scranton avenue, Cleveland, Ohio, are manufacturing an improved Mrs. Potts' sad iron handle. The improvement relates to the metallic part of the handle which is called the stretcher. This is now made of steel, nickel plated or tinned, instead of cast iron. It combines lightness and strength without the breakage attending the iron stretcher handles. The ends of the stretcher are turned up, as shown in the illustration herewith, for the same reason that the iron stretcher has hollow lugs at each end—namely, to keep the screw heads as far as possible from the hot iron, and thus avoid unduly scorching or burning the wood. The wooden circles used in the manufacture of these handles are of exactly the same dimensions as used on the regularly made handles, but are only of hazel.



Improved Sad Iron Handle.

PLUMBING and GAS FITTING.

Illinois State Convention.

The first annual convention of the Illinois Master Plumbers' Association was held in Peoria June 7. W. T. Geary of Chicago, State vice-president of the National Association, opened the meeting. An address of welcome was delivered by Mayor Miles. The following officers appointed at the May session in Chicago were in attendance: Robert Loudon, president, Bloomington; W. T. Geary, vice-president, Chicago; J. R. Scanlon, treasurer, Elgin; B. B. Breen, secretary, Chicago. Executive Committee: Robert Loudon, Bloomington; J. R. Scanlon, Elgin; W. E. Goodman, South Evanston; William H. Durham, Rockford; David Whiteford, Chicago; T. P. Cullon, Chicago; P. Sanders, Chicago; W. T. Geary, Chicago; A. W. Murray, Chicago. The purpose of the meeting was to form a more perfect organization for the advancement of the plumbing business of the State and to procure, if possible, proper legislation leading to more perfect sanitary plumbing and a better class of work throughout the State. The association proposes to do this and asks for the appointment of inspectors for towns having water and sewerage systems and if possible for the examination by a competent board of applicants for plumbing licenses.

Entertainment at Detroit.

The Master Plumbers' Association of Detroit, Mich., held a meeting at the Builders and Traders' Exchange rooms last week, at which the programme for the annual convention of the National Master Plumbers' Association was adopted. The convention will be held in Detroit on Tuesday, Wednesday and Thursday, June 19, 20 and 21, and between 500 and 600 delegates, including the members of the local association, will attend.

There are 60 members in the city who, together with the delegates from the State, will form the Michigan delegation of about 100 men. They will meet at the Builders and Traders' Exchange on Tuesday, June 19, at 9 a.m. All will wear a uniform consisting of white Fedora hats, black suits and canes. Headed by a band, they will march to the Hotel Cadillac, where all the delegates from outside of the State will be assembled, having been escorted thither from the depots and other hotels by a committee.

Colonel McGurrin of Grand Rapids, chief marshal, and Colonel Wheeler of Kalamazoo, his aide, will take charge of the parade, which will move as follows: From the Cadillac Hotel down Michigan avenue to Woodward avenue, around the Campus Martius, back to Michigan avenue, and up Lafayette avenue to Philharmonic Hall, where the business session will be held.

Tuesday night the delegates will be given a moonlight excursion up and down the river on the new steamer "Pleasure."

While the delegates talk business on Wednesday afternoon, the lady guests will be given a ride around the city. At 4 p.m. all the gentlemen and ladies will be taken to Alexander's, above Walkerville, by steamer. After supper they will be given a short ride on the river and then return to the city.

The business sessions will close some time on Thursday evening. During the afternoon the lady visitors will be given another carriage ride around the city and to Belle Isle. On Friday morning at 8 o'clock the steamer "Pleasure" will leave the foot of Woodward avenue with all the delegates and their ladies on board and steam up to the Oakland on the St. Clair River, where dinner will be served. The party will return to Detroit at 6 p m.

James H. Crumley is president and Thomas F. Morris secretary of the local association. The entire association constitutes the Reception Committee, of which George Lane is chairman. The Committee of Arrangements consists of James Meathe, president of the State association; James W. Partlan and Benjamin Guiney. Benjamin F. Guiney will act as general utility man.

The Plumber of To-day.

The following is the address made by Zalmon Goodsell at the banquet tendered by S. E. Dibble to the New Haven, Conn., Master Plumbers' Association on retiring from the presidency:

During the past six years, a new order of things has come to pass. We formerly found that competition with the manufacturer and wholesale dealer was an impossibility; combination and organization were necessary before our just claims would be considered or listened to. The call was responded to by members of our trade joining from all over the country. The sequel has been wonderful in its far reaching results. To day, after six years of labor, we have local and State organizations everywhere. We have rights granted that we never dreamed of or dared ask for before. To-day, instead of botchy and slighted work being common, it is very uncommon. Better work is done, more care is taken. The honor of our association is at stake. No member wants the reputation of doing an injury to his neighbor or to himself. To-day the industrious and ambitious plumber and apprentice are striving to be better educated and better acquainted with their adopted profession, hoping some day they may be able to have a business of their own and be competent to take charge of the same.

To day we are expected to know all about hydraulics, boilers, engines, pumps and connections and their uses; about gas fitting, steam heating, furnaces, stoves, tinning, drafting, shop work, sanitation, ventilation, drainage and many other branches of knowledge that enter into the construction of a building, from the smallest cottage to the largest edifice. To-day there are thousands of goods of different varieties and sizes, of every conceivable shape manufactured for our use, giving employment and support to hundreds and thousands of men all over the country. How many of these working people would be homeless and in want if it were not for the thrift and enterprise of the plumbing trade that keeps them employed? To-day the different trades in unison, by furnishing employment to the skilled mechanic and the laboring people, enable them to build their homes, support and raise their families in comfort. This increases the population and wealth of all towns and cities. This fact proves that the trades lay the foundations of progress for all municipalities. To day we must for the good of our cause go forward, not backward. Our status will be made stronger; then new impulses will secure desired legislation for the protection of human life and more perfect work. Can we trust this duty to strangers that are not educated in our trades, or shall we by organization and devotion to our needs spare a part of our own time from business pursuits to certain public duties?

To day our trade does not hear the expressions and receive the unseemly ridicule from others nearly so much as formerly. We are deserving of more respect, and why should not this be so? None but the brightest minds can ever hope to half understand the large variety of knowledge and skill required to make a good workman and a competent master. Our practical experience, instead of theoretical, gained by years of time and application, demands superior intelligence to learn the trade's intricate requirements. To-day we are the equal of any profession. We hear words of wisdom at our different gatherings, of prominent members who a few years since did not know the latent powers of thought and speech they were endowed with, until the opportunity arose that developed their minds. Knowledge of our work is never ending, it will be continuous as long as the genius of man exists. To-day we have good fellowship and harmony among the craft instead of dickerings, bickerings and jealousy. We meet with one common interest, knowing by all experience that what benefits one member benefits all alike. To-day, would any member dare place himself on record as desiring to have the leaves in our book of progress torn out and go back to the old methods, of every man for himself, when the combined intellect of our members has brought forth so many new and needed inventions for the convenience and health of the people?

For six years we have been talking and telling over the same old story, of our hopes and fears, of our ambitions, singly and collectively, of how near to accomplishment we have come to their realization. To some this may seem dull music; still we should be more than willing to bear up under the old strains, as all objects desired are gained by persistency, and perfectness by continued repetition and practice. We cannot bring forth new thoughts and ideas without re-examinations of the old familiar ones. We each have our mission in life to fill, every one in his own peculiar sphere. Some will by

their energy make their years spent upon earth of great benefit to mankind, by being broad minded, charitable and helpful to their fellow beings. Others may come and go having gained a bare subsistence. They live in an atmosphere of egotism and small surroundings. They may have done some good and more of evil. These constitute a large majority of the atoms of humanity among the millions that inhabit this earth. We pray the time may come when every human being will be counted on the side of well doing. Let every person try to do one thing perfectly, have some object in life before death comes. A record of success in life's struggles lives after you are gone, and you will not have lived in vain.

Gas and Gas Fitting.—I.*

BY J. W. HUGHES

Introductory.

It is my intention to write, under the title "Gas and Gas Fitting," a series of articles for *The Metal Worker* suitable to the requirements and understanding of the ordinary reader. It is my special desire to make the articles of use to those who may be called upon, from time to time, to execute in a practical way such work as may come to hand in the usual course of a small plumbing and gas fitting business conducted in a large city, or in the general tinsmithing, plumbing and gas fitting shop of the smaller towns. Little that is new will be advanced, and anything in the way of the higher science of the subject will be avoided. The first, because anything new on the subject of ordinary illuminating gas, speaking in a general way, is exceedingly hard to find; and secondly, because the higher scientific side of the question would, I take it, be of little practical interest to my readers. My authorities will be the encyclopedias, mechanical dictionaries and facts gleaned from writers of authority, supplemented by information gathered from practical gas fitters, whose life work has been the fitting up of the various pipes and fixtures. Finally, such knowledge on the subject as some 30 years' general practice in the art has given me, is at the disposal of the reader, provided I have the skill to put it within his resch.

When the ordinary person hears gas spoken of the conclusion is immediately come to that lighting gas is the subject under discussion. But the word "gas" covers a larger field. An old dictionary explains the word as follows: "Gas—a spirit not capable of being coagulated, the essential spirit into which all matter is resolvable; an inflammable vapor, which is obtainable from combustibles, and is used for lighting up; also obtainable by decomposition for all things, more or less." Rather a quaint definition, but in the main correct enough to suit the present purpose. The "obtainable from combustibles" and "is used for lighting up" (part of the above quotation) is what is of particular interest in the present case. Such a person will also have in his mind the idea that gas is quite a modern discovery or invention. He is aware that the grandfathers of the present generation of mature years used whale oil and tallow candles when they did any lighting up. But there is nothing new under the sun, and natural gas has been used from remote times in China, Central Asia and near the Caspian Sea for purposes of heating, lighting and manufacture. It is undoubtedly true, furthermore, that the sacred and perpetual fires that received the adoration and worship of that very ancient religious sect, the Fire Worshippers, were gas fires fed by natural gas issuing from fissures in the earth.

The general introduction of gas as a lighting material is undoubtedly of modern origin. About 1786 Earl Dundonald made experiments on gas lighting at Culross Abbey, his search, however, not being for light but for the tar that resulted from the distillation of coal. The gas in the noble Earl's works was a by-product, being regarded as a very interesting curiosity. In modern gas works it is the gas that is sought for (the tar being one of the by-products), although the by-products of an up-to-date gas plant, consisting of coke, tar, ammonia, analine dyes, &c., &c., are more valuable than the gas. In fact, I have authority for saying that though not a foot of gas was used for ordinary lighting and heating purposes, the distillation of coal would still be a very profitable industry.

In 1792 William Murdock lighted his shop at Redruth, Cornwall, with coal gas. He afterward fitted up a more extensive plant near Birmingham, England, for lighting the workshops of the celebrated firm of Boulton & Watt, engine builders, and about 1803 he fitted up several cotton mills in Manchester. To him is generally given the credit of being the discoverer and introducer in a practical way of modern gas lighting, and not without right. However, as far back as 1667 the "Transactions" of the Royal Society gave an account of a burning spring in one of the coal districts of England, and alluded to the fact that Thomas Shirley traced its source to gas escaping from the underlying coal beds. It is not necessary to go further into the history of gas, but it is to be hoped that enough has been put before the reader to awaken an interest in the subject and prompt the reading necessary to fuller information.

Coal gas, which is most commonly and generally used through the world for lighting, heating and cooking, is obtained by a simple process of distillation, bituminous coals being selected as most likely to give the best results, although cannel coal holds a high place in the opinion of gas engineers.

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Banqueted by S. E. Dibble.

At the eleventh annual meeting of the Master Plumbers' Association of New Haven, Conn., after the report of the president, S. E. Dibble, which was the feature of the meeting, the following officers were elected. In spite of the efforts of the members to the contrary, Mr. Dibble insisted on the election of some other president, he having served four years. The officers for the ensuing year are: President, Franklin A. Curtiss; first vice-president, Edward A. Rourke; second vice president, Andrew J. Clerkin; recording and financial secretary, James M. English; corresponding secretsry, F. A. Carlcton; treasurer, W. H. Hazel; sergeant-at-arms, T. W. Corbett.

The delegates to the national convention at Detroit are: President Curtiss, A. J. Clerkin and S. E. Dibble.

The meeting adjourned to a banquet tendered by Mr. Dibble, served at the Republican League House, to which several guests from out of the city were invited. At a handsomely decorated table, with music by an orchestra, the following *menu* received universal attention:

Clams on Half Shell,
Sherry.

Consommé Puritanière,
Boiled Halibut, Hollandaise Sauce,
Sauterne.

Parisienne Potatoes,
Sliced Cucumbers,
Roast Spring Lamb, Mint Sauce,
Champagne.

Peas, Potatoes, Asparagus,
Lettuce, Tomatoes,
Chicken Salad.

Ice Cream
Assorted Cakes, Crackers and Cheese,
Fruit, Coffee, Cigars.

When the cigars made their appearance and the clouds of smoke put every one in a good humor, Mr. Dibble rose, but before he had time to speak A. J. Clerkin surprised him by the presentation of a magnificent gold watch chain with a diamond studded locket inscribed as follows: "Presented to S. E. Dibble, President, by the Members of the New Haven Association of Master Plumbers, June 5, 1894." Mr. Clerkin prefaced the gift by a few well worded remarks, paying a fitting tribute to Mr. Dibble's long and faithful tenure of office.

Mr. Dibble was taken completely by surprise, but thanked the association in a heartfelt manner. Among the other speakers were Jas. Ahern, J. B. Weiant, C. S. Esmes, Zalmon Goodsell, who was introduced as the plumbers' candidate for Governor; John S Craig and Robert Morgan. Elmore Dibble, the son of the host, gave a violin solo, and James Ahern sang "The Sword of Bunker Hill" as only he can sing it. Plumbing Inspector John D. Eldridge and Fire Commissioner W. H. MacDonald also made short addresses, when the gathering dispersed with pleasant thoughts of Mr. Dibble as an official and a host.

The following were present at the banquet: James Ahern of Hartford; A. J. Clerkin, J. B. Weiant of New Britain; John S. Craig of Hartford, and C. S. Eames of Bridgeport, officers of the State Association of Master Plumbers; Zalmon Goodsell of Bridgeport; S. W. Damon of New Britain; Robert Morgan, F. A. Curtiss, J. Newton Pierpont, J. H. Buckley, W. H. Hazel, F. A. Carleton, J. D Eldridge, James E Howland, Edw. A. Rourke. Thos. P. Rourke, Wm. Keane, T. W. Corbett, Jas. M. English, Wm. H. MacDonald, T. A. Potter, Thos. Gunning, D. E. McNamara, E. N. Botsford, A. B. Sproul, W. F. Redfield and Willard C. Warren.

TRAPS AND VENTS.

AT THE FINAL MEETING of the delegation from the New York City Association of Master Plumbers to the national convention at Detroit, it was unanimously resolved "to present the name of and support Vice-President Mitchell of New York as our candidate for president of the National Association for the coming year." The meeting was well attended, 28 out of the 37 delegates being present. In reference to the matter of his nomination, Mr. Mitchell said: "Should the association confer on me the honor of the presidency I shall endeavor to advance its standard for usefulness in the interest of all; should some other man receive the honor, I shall congratulate him and feel that I have been relieved of a great responsibility and will render him such assistance as is due from a loyal member." Mr. Mitchell has always been an active man in the affairs of the association, and his work during the past year

has reflected much credit upon his executive ability and untiring energy in forwarding the interests of the master plumbers.

THE MASTER PLUMBERS' ASSOCIATION of Lynn, Mass., organized through the influence of National President Daniel G. Finnerty, is composed of the following members: L. A. May Company, F. R. Niles & Co., Geo. E. Sleeper & Co., John F. Morgan & Son, John Hunt, John H. Pension, Joseph McGilvary, M. B. McLaughlin, Jas. R. Hughes, Pote & Upton, Talbot & Co., Harnwer & Quimby, Myles F. Moran, T. B. Reardon, W. I. Wiley, Jas. H. Curry, W. E. Lewis, Jas. F. Ryan, John Gard, R D. Potter. They have affiliated with the National Association and have elected the following officers: President, J. F. Morgan; secretary, Edward M. Russell; treasurer, J. C. Donnelly.

IT IS GRATIFYING to know the strict way in which the law concerning unlicensed master plumbers is being enforced in this city. We have already called attention to instances of fines for violations of it, and this week another plumber without a license was fined $25 in the Court of Special Sessions for doing an overhauling job.

THROUGH THE KINDNESS of the president of the National Association of Master Plumbers, Daniel G. Finnerty of Boston, we are in possession of a copy of the law recently passed in Massachusetts relative to the licensing of plumbers and the supervision of the business of plumbing.

J. W. PETRY & Co. are a new firm in the plumbing and heating business at Fourth and Verona streets, Long Island City, N. Y.

A SARCASTIC WRITER in one of the Albany, N. Y., daily papers asks: "Can any one tell me why all plumbers use for a sign a water closet bowl? It certainly is not a pleasant object to see stuck in two or three windows, or woise yet, outside, on every street. There is nothing attractive about it—in such a position, at least."

THE DIFFERENCE between the master and journeymen plumbers at Jacksonville, Fla., has been adjusted and $3 will now be the pay and nine hours will constitute a working day.

THE MASTER PLUMBERS' ASSOCIATION, formed last month at Lowell, Mass., through the efforts of National President Daniel G. Finnerty, composed of the following members, has affiliated with the National Association: H. H. Wilder, T. Costello & Co., S. H. Jones, H. R. Barker Mfg. Company, Farrell & Conaton, D. H. Wilson & Co., Drury & Green, James McLarney, J. W. Stewart, Scott & O'Day, Aaron C. Ladd, Jno. H. Barry, Ezra A. Nichols, Jas. Caddell, Wm. F. Enright. The following delegates were elected to attend the national convention: T. Costello, S. H. Jones, P. F. Conaton, D. H. Wilson.

JOSEPH HAIRE bid $1075 and secured the contract for the plumbing in the new Industrial School at Newport, R. I.

THE BRIDGEPORT STEAM HEATING COMPANY, Bridgeport, Conn., are putting in a line of plumbers' supplies, which they will make a special feature of their business with the intention of furnishing everything required by the plumber to do first class work. They will, we understand, do no contracting and will not do any plumbing work, but will sell to the trade alone.

THE MASTER PLUMBERS' ASSOCIATION of Worcester, Mass., met at the Builders' Exchange last week to discuss matters pertaining to the convention of the master plumbers, at Detroit, June 19. John F. Deedy and Henry Desper were elected delegates, with J. W. Jordan and O. S. Kendall as alternates.

EUGENE LEWIS has purchased the plumbing establishment of C. J. Tremaine, on Pine street, Bradford, Pa.

DELEGATES ELIAS BERLA AND ALEXANDER DON of the Newark, N. J., Master Plumbers' Association will be accompanied to the Detroit convention by ten other members of their association who are interested in the work.

P. E. COX of Fort Wayne, Ind., intends opening a branch plumbing shop in Columbia City, with Chas. Frixler in charge.

THE SHUSTER FOUNDRY, at Franklin and Willow streets, Philadelphia, report a good demand for their soil pipe and fittings, notwithstanding the dull times. This is mainly on account of the quality of their productions. Their pipe is guaranteed, and plumbers know that if a leak is discovered and traced to a sand hole or other defect in the pipe, the faulty length will be cheerfully replaced, and the time occupied in taking it out and putting the new length in paid for by the concern. Their fittings are appreciated by the trade because they are 2 inches longer on the bead end than the fittings commonly sold.

NATIONAL TREASURER W. E. GOODMAN has made special arrangements for transporting the Milwaukee delegation to the Detroit convention of master plumbers. They will attend in full force.

THE BROOKLYN, N. Y., DELEGATION to the master plumbers' convention at Detroit will leave on the 9.15 train on Sunday morning, over the Erie road, with a full representation.

THE NEW BOARD OF PLUMBING EXAMINERS has organized at Dorchester, Mass., by choosing Dr. G. H. Smith chairman and Plumbing Inspector Murray secretary. All plumbers who were not in the business previous to June 10, 1893, must take the examination, application for which had to be filed before June 15.

THE SANITARY PLUMBING COMPANY, Columbus, Ohio, have opened a branch at Chillicothe, Ohio. E. Futerer and H. Hannon are two members of the company, who have also an expert sanitary engineer and a corps of skilled workmen. They will furnish a consulting engineer to the local plumbers and citizens who desire such service.

JOHN MITCHELL, president of the New York City Master Plumbers' Association, will lead the delegation to the Detroit convention accompanied by the Paterson, N. J., delegates in charge of John Hickman and the Bridgeport, Conn., delegation with a military commander, Major Middlebrook. The West Shore route has been selected, two special cars having been chartered, and the delegates are requested to be at the West Forty-second Street Ferry at 4.30 p.m. this afternoon.

EX-PRESIDENT S. E. DIBBLE of the Connecticut State Association of Master Plumbers sends us a report of the fourth annual convention held at Hartford February 15. It is a book of 96 pages, giving portraits of the executive officers, a list of the officers and committees, the essays by Zalmon Goodsell, John Troland, Jos. G. Shearlock and Robert Morgan, a list of the members and the constitution and by-laws of the State association.

AN INTERESTING CIRCULAR is being distributed by Thomas Kelly & Brothers, 123 Franklin street, Chicago, Ill., addressed to architects and the plumbing trade. The body of the circular is given up to testimonial letters, signed and dated, all of which speak in the most flattering terms of the Kelly specialties. Many of these letters are from very prominent users of sanitary goods, and they come from all parts of the country. The articles particularly noted on the circular are Kelly's self acting water closets, noiseless water closets, self acting urinals, stop and waste cocks and sanitary wash basins.

PETER J. CARPENTER, Dobbs Ferry, N. Y., has secured the contract for the plumbing and gas fitting of J. J. McComb's new mansion. The contract was signed last week, and will amount to about $15,800.

A New Law in Massachusetts.

Last week Governor Greenhalge of Massachusetts signed the following law known as Chapter 455, "An act relative to the licensing of plumbers and the supervision of the business of plumbing:"

SECTION 1. No person, firm or corporation shall engage in or work at the business of plumbing, either as a master or employing plumber, or as a journeyman plumber, unless such person, firm or corporation has received a license or certificate therefor, in accordance with the provisions of this act. The words "practical plumber," as used in this act, shall be deemed to mean a person who has learned the business of plumbing by working for at least two years either as an apprentice or under a verbal agreement for instruction, and who has then worked for at least one year as a first-class journeyman plumber. The word "journeyman," as used in this act, shall be deemed to mean one who personally does any work in plumbing which is subject to inspection under Chapter 419 of the acts of the year 1892, or under any ordinance, by-law, rule or regulation made under the authority of this act.

SEC. 2. Any person not engaged in or working at the business of plumbing prior to July 10 in the year 1893, and desiring to engage in or work at said business, either as a master or employing plumber, or as a journeyman plumber, shall apply to the Board of Health having jurisdiction in the locality where he intends to engage in or work at said business, except in cities or towns where the inspector of buildings has control of the enforcement of the regulations regarding plumbing, where such application shall be made to the inspector of buildings, and shall, at such time and place as may be designated by the Board of Examiners hereinafter provided for, to whom such applications shall be referred, be examined as to his qualifications for such business. On or before September 1 in the year 1894, every master or employing plumber, and every journeyman plumber, engaged in or working at the business of plumbing in this Commonwealth prior to July 10 in the year 1893, and desiring to engage in or work at said business in any city or town where licenses for plumbers are required, shall personally register his name and address at the office of the Board of Health or of the inspector of buildings, to whom applications for licenses are to be made in such city or town, and state after being sworn where and how long he has been engaged in or has worked at said business and whether as a master or employing plumber or as a journeyman plumber. Said Board of Health or inspector of buildings, if satisfied that the person so registering was actually engaged in or working at said business prior to said date, shall thereupon issue to him a certificate, setting forth that he was eugaged in or working at the business of plumbing, either

as a master or employing plumber, or as a journeyman plumber, as the case may be, prior to July 10 in the year 1893, and authorizing him to engage in or work at said business, either as a master or employing plumber, or as a journeyman plumber. The fee for a certificate for a master or employing plumber shall be $2; for a journeyman plumber it shall be 50 cents. Said certificate shall be valid and have force throughout the Commonwealth. In the case of a firm or corporation the examination and licensing of, or the registration of and granting a certificate to, any one member of the firm or the manager of the corporation shall satisfy the requirements of this act.

SEC. 3. There shall be in every city, and in each town of 5000 inhabitants or more, and in each town having a system of water supply or sewerage, a Board of Examiners of Plumbers, consisting of the chairman or such other member of the Board of Health as said board may designate, and in cities or towns having an inspector of buildings, the inspector of buildings of said city or town, who shall be members *ex-officio* of said board and serve without compensation, and a third member who shall be a practical plumber of at least five years' continued practical experience, either as a master or as a journeyman, during the years next preceding the date of appointment. Said third member shall be appointed by the Board of Health of said city or town within three months from the passage of this act for the term of one year from May 1 in the year of appointment, and thereafter annually before June 1, and shall be allowed a sum not exceeding $5 for each day of actual service, to be paid from the treasury of said city or town. Provided, that if in any city or town there is no inspector of buildings said Board of Health shall also appoint the second member of said Board of Examiners, whose term of office and compensation shall be the same as is heretofore provided for said third member.

SEC. 4. Said Board of Examiners shall as soon as may be after the appointment of said third member meet and organize by the selection of a chairman, and shall then designate the times and places for the examination of all applicants desiring to engage in or work at the business of plumbing within their respective jurisdictions. Said board shall examine said applicants as to their practical knowledge of plumbing, house drainage and plumbing ventilation, and shall submit the applicant to some satisfactory form of practical test, and if satisfied of the competency of the applicant shall so certify to the Board of Health or inspector of buildings in their respective city or town. Said board or inspector shall thereupon issue a license to such applicant, authorizing him to engage in or work at the business of plumbing either as a master or employing plumber or as a journeyman plumber. The fee for a license for a master or employing plumber shall be $2; for a journeyman plumber it shall be 50 cents. Said license shall be valid and have force throughout the Commonwealth, and shall be renewed annually upon a payment of a fee of 50 cents. In case of removal beyond the jurisdiction of the board or inspector issuing the original license it may be renewed by any board having like authority.

SEC. 5. The Board of Health or Inspector of Buildings, where such inspector has control of the enforcement of the regulations regarding plumbing of each city and town mentioned in Section 3 of this act, shall within three months from the passage of this act appoint one or more Inspectors of Plumbing, who shall be practical plumbers of at least five years' continued practical experience, either as masters or as journeymen, during the years next preceding the date of appointment, and who shall hold office until removed by said board or inspector for cause, which must be shown. All such inspectors shall before appointment be subjected to an examination before the Civil Service Commission. The compensation of such inspectors shall be determined by the board or inspector appointing them, subject to the approval of the City Council or Selectmen, and shall be paid from the treasury of their respective cities or towns. Said inspectors shall inspect all plumbing work for which permits are hereafter granted within their respective jurisdiction in process of construction, alteration or repair, and shall report to said board or inspector all violations of any law, ordinance, by-law, rule or regulation relating to plumbing work, and also perform such other appropriate duties as may be required. The approval of any plumbing by any other inspectors than those provided for under this act shall not be deemed a compliance with the provisions thereof.

SEC. 6. No inspector of plumbing in any city or town shall inspect or approve any plumbing work done by himself, or any person by whom he is employed, or who is employed by or with him, but in each city or town subject to the provisions of this act the Board of Health shall appoint an additional inspector of plumbing, in the same manner and subject to the same qualifications as the regular inspector of plumbing, whose duty it shall be to inspect in the manner prescribed in this act plumbing work done by the regular inspector or any person by whom he is employed, or who is employed by or with him. Said additional inspector shall have authority to act in case of the absence or inability of the regular inspector, and shall receive for his services such compensation as the regular inspector would for a like duty. The provisions of this section shall not apply to any city or town which has heretofore established or may hereafter establish an annual salary for the position of inspector of plumbing, and in any such city or town no inspector of plumbing shall engage in or work at the business of plumbing.

SEC. 7. Each city or town of 5000 inhabitants or more, and every town having a system of water supply or sewerage, shall by ordinance or by-law, within six months from the passage of this act, prescribe rules and regulations for the materials, construction, alteration and inspection of all pipes, tanks, faucets, valves and other fixtures by and through which waste water or sewage is used and carried; and provide that no such pipes, tanks, faucets, valves or other fixtures shall be placed in any building in such city or town except in accordance with plans which shall be approved by the Board of Health of such city or town, or the inspector of buildings, where such inspector has control of the enforcement of the regulations regarding plumbing; and shall further provide that no plumbing work shall be done, except in the case of repair of leaks, without a permit being first issued therefor, upon such terms and conditions as such cities or towns shall prescribe. But nothing in this section shall prevent Boards of Health from making such rules and regulations in regard to plumbing and house drainage hitherto authorized by law, which are not inconsistent with any ordinance or by-law made under the authority of this section by the respective cities or towns within which such Boards of Health have jurisdiction. The provisions of this section shall not apply to the city of Boston or to any officer or board thereof.

SEC. 8. Any person violating any provision of this act, or any ordinance, by-law, rule or regulation made thereunder, shall be deemed guilty of a misdemeanor, and be subject to a fine not exceeding $50 for each and every violation thereof, and if such person has received a license under this act, his license may be revoked by the board or inspector issuing the same, and if such violation was committed in a city or town other than that where he received his license, the Board of Health or inspector of buildings having jurisdiction may forbid him to engage in or work at the business of plumbing for a period not exceeding one year in the city or town where the violation was committed.

If any person to whom a certificate has been issued under this act violates any provision thereof, or any ordinance, by-law, rule or regulation made thereunder, either the Board of Health or Inspector of Buildings issuing his certificate, or the Board of Health or Inspector of Buildings having jurisdiction where such violation was committed, may forbid him to engage in or work at the business of plumbing in such city or town for a period not exceeding one year. Any person engaged in or working at the business of plumbing in any city or town where he has been forbidden to do so under this section shall be deemed guilty of a misdemeanor, and be subject to a fine not exceeding $100 for every such offense. Any city or town mentioned in Section 3 of this act refusing to comply with any of the provisions of this act shall forfeit the sum of $50 to the use of the Commonwealth for every month during which such neglect may continue.

SEC. 9. The provisions of this act shall apply to all persons who are now or may be hereafter learning the business of plumbing, when they are sent out to do the work of a journeyman plumber.

SEC. 10. Any person now holding an appointment as inspector of plumbing may retain his position, and without further examinations, be deemed to have been appointed under this act.

SEC. 11. The Boards of Health and inspectors of buildings hereinbefore mentioned may expend such portion of all fees collected by them under this act as shall become necessary to properly perform all duties imposed by the passage of this act. The said boards or inspectors shall annually, before June 1 make a full report in detail to their respective cities or towns, of all their proceedings during the year under this act.

SEC. 12. All acts or parts of acts inconsistent herewith are hereby repealed. The provisions of this act, so far as they are the same as those of chapter 477 of the year 1893, shall be construed as a continuation of that chapter, and not as new enactments.

A NEW PLUMBING ESTABLISHMENT has been opened at 104 Main street, Ottawa, Ill., by Read & Law of Chicago.

BISSELL CHAMBERLAIN has opened a plumbing shop in the Walden Block, Willimantic, Conn.

C. H. WILLIAMS will represent the New York Central Iron Works, Geneva, N. Y., at the plumbers' convention at Detroit, and the Dunning steam and hot water heater will be incidentally the subject of an occasional remark.

Simple Remedy for Trouble in a Telephone.

The following letter to the *Electrical World* is pertinent at the present time when telephonic communication between the several departments of manufacturing establishments is becoming so common:

"A friend of mine in a neighboring establishment has a telephone containing three ordinary Bell receivers, which are used both as transmitters and receivers. They gave trouble constantly. One would be reported as 'not talking,' and he would take off the cap and find nothing wrong, would put the cap back again and it would work all right. Perhaps in an hour or so it would again refuse to act. This was kept up for several months. He tried varying the distance of the diaphragm from the magneto, and also examined the circuit time and again, but with no better success. One day we noticed that the edge of the orifice of the cap came very close to the diaphragm, and I suggested that perhaps a drop of saliva might lodge against the diaphragm and the edge of the orifice and impede vibration. This was found to be the case, and a ring of thick cardboard placed between the cap and the diaphragm remedied the trouble completely."

A New Bedford, Mass., rope company have received an order from a Chicago firm for a rope which, it is said, will be the largest ever made. It is to be used on the driving wheel in the engine room of the Chicago Cable Road Company. It will be 3 inches in diameter and 11 inches in circumference. There will be 12 of these ropes on the wheel; each of them will be 1260 feet long and the combined length of the 12 ropes will be 3 miles. The cost will be $5000.

Petroleum in paying quantities is being found in Wilson, Neosho and Allen counties, Kansas, and about 40,000 acres of land have been leased by oil operators from Pennsylvania.

Baltimore comes next in importance to New York as a grain shipping port, handling 50,000,000 to 60,000,000 bushels annually, and about 3,500,000 barrels of flour.

TIN PLATES.

A Strange Statement.

It will be news, indeed, to the trade that the tin plate mills of this country have during the past winter been selling nearly all their product in Canada, "the boasted home market having proved insufficient to furnish a source of trade." Yet this is the surprising statement made editorially in a recent issue of a Pittsburgh daily. The announcement was so authoritatively made that it probably set some uninformed persons wondering whether the American tin plate manufacturers had already opened up a large export trade for their product. The facts of the case, however, given on the best authority, prove that the writer of the statement in question has gotten hold of a very small mole hill, and with the aid of an exceedingly powerful imagination has magnified it into a mountain of great proportions. In a late issue of *The Metal Worker* an extract was given from an article in the *Canadian Manufacturer*, which spoke in high terms of the superior qualities of a box of assorted tin plates of American manufacture which had been received and tested by a Toronto manufacturing firm. This one shipment of a single box of American plates, sent for comparison with the Welsh product, covers, so far as we have been able to ascertain, the entire export movement, which, according to the Pittsburgh *Post's* statement, has of late absorbed nearly all the product of our domestic tin and sheet mills. Of course, every one with a grain of information is aware that American tin plate makers cannot yet hope to sell their goods in Canada in competition with the Welsh product. Nor do they need to seek outside markets, for there is, as we have before pointed out, an active demand within the limits of the United States for every sheet of tin and terne plates they can at present produce.

SCRAP.

ÆTNA STANDARD IRON & STEEL COMPANY, Bridgeport, Ohio, have two mills in operation, rolling black plates for tinning. The firm's new tinning department will be completed within a few weeks, when they will commence the manufacture of both bright and terne plates.

A CONSIDERABLE QUANTITY of black plate is now being shipped from Great Britain to Italy, to be converted into turned plates in the lately established works at Piombino.

THE BRITTON ROLLING MILL COMPANY, Cleveland, Ohio, manufacturers of iron and steel sheets, and who have had under erection for some time a plant for the manufacture of tin and terne plate, advise us that one tin mill will be started on Monday, the 18th inst., providing a supply of coal can be obtained. This firm expect to have two more mills in operation by August 1 next.

ACCORDING to the British Board of Trade statistics for May, 1894, the total exports of tin and terne plates from Great Britain during the month were 30,000 tons, against 37,000 tons in May, 1893. Shipments to the United States show a considerable increase over those of April, and were larger than in any previous month of this year. The following figures show, in round numbers, the shipments to this country since January 1: January, 18,000; February, 13,000; March, 16,000; April, 13,000; May, 21,000 tons. In May, 1893, the receipts of Welsh tin plates amounted to 26,000 tons.

THE MORFA TIN PLATE WORKS, Llanelly, South Wales, were restarted this week after a prolonged suspension.

CAPITALISTS of Cambridge, Ohio, have announced their intention of building a rolling mill for the manufacture of black plates for tinning purposes. The proposed plant is to be built at the junction of the Baltimore & Ohio and the Cleveland & Marietta railroads, and will consist of about six mills, together with a train of cold rolls and complete equipment. The buildings projected are one 200 x 100 feet for rolling mill purposes, one 200 x 60 feet for annealing, pickling and shipping, and a boiler house 40 x 60 feet. All buildings will be constructed of steel and iron and the machinery has been designed to conform to modern ideas of economical production of the best quality of plates obtainable. The leading spirits of the enterprise are John Marquand, C. L. Campbell and John C. Beckett, all of Cambridge. It is expected that the organization will be completed in a few days.

THE TIN HOUSE recently erected by the Ætna Standard Iron & Steel Company, Bridgeport, Ohio, has a capacity for tinning about 900 boxes of black plates per week, the outfit consisting of three sets, one for terne and two for bright plates. This firm do not expect, however, to put any coated plates on the market until about July 1. Their black plate mills have been in operation for about ten days working up stock for the tinning house. Their rolling mill proper is working to about two-thirds capacity on natural gas, the remaining portion being off on account of the coal strike.

NEW PHILADELPHIA IRON & STEEL COMPANY, New Philadelphia, Ohio, are adding six tin mills to their plant and will, we are informed, shortly be in the market with black sheets for tinning purposes, in addition to their former line of sheet iron products.

EASTERN TIN PLATE MANUFACTURERS are at the present time feeling the effects of the coal strike in the dearth of American black sheets. They find it very difficult to obtain a sufficiency of the domestic product and are obliged to exercise the virtue of patience to an uncomfortable degree. As an illustration of the active demand now existing for American sheets for tinning purposes, the New York agent of a Western sheet mill mentioned a day or two ago the fact that he had just been obliged to refuse large orders from three tin plate makers who came at almost the same time, one wishing for ten carloads of black sheets, prompt delivery, for spot cash another two carloads a week for eight weeks, and the third wanting to take as much of the material as he could get. All the black sheet mills are rushed with orders and tin plate manufacturers are said to show a marked disinclination to take any but the American rolled product, which they find much better suited to their purposes than the imported article.

ACCORDING to a return published last week by the secretary of the Welsh Tin Plate Makers' Association, there are at the present time 90 tin plate works, with 510 mills, in existence in Great Britain. Of these mills, 330 are in operation and 180 are idle. Among the latter, however, are about 30 which are virtually out of business altogether and not likely to restart. Consequently the proportion of idle producing capacity is about 30 per cent. of the whole, a smaller ratio than was generally believed to be inactive. Since the above figures were given one or two of the then idle mills are reported to have resumed operations, still further reducing the proportion of idle works

Trial of the U. S. Cruiser "Minneapolis."

On her preliminary trial trip last week, the new Philadelphia built triple screw cruiser "Minneapolis" attained the remarkable speed of 22.26 knots per hour, under the disadvantage of burning anthracite coal instead of the Pocahontas coal, always used on trial trips hitherto. Her sister vessel, the "Columbia," only made 20.98 knots on her first trial, so that the "Minneapolis" showed fully 1¼ knots greater speed. The trip was made off the New Jersey coast under far from favorable conditions as regards weather. Nevertheless the trial proved throughout the most satisfactory and successful run of any ships the Cramps have built. Passed Assistant Engineer Willets, who represented the Engineering Bureau on the "Minneapolis'" trial trip, reports that the performance of the machinery was remarkably good. On the 7th a maximum speed of 22.26 knots was maintained in deep water for an hour with an average of 128 7 revolutions per minute of all three engines, steam pressure 160 pounds at the boilers, forced draft of less than 1 inch air pressure, throttle half open. The displacement of the ship was less than 7000 tons, and the speed was recorded by patent log, corrected from runs over a known course the day previous. The engines ran very quietly and steadily at all speeds with no unusual vibration. The indicator cards taken on the last part of the deep sea run were worked out, showing 20,080 horse-power. The "Minneapolis" will make her official run about July 9.

Illuminating oil sold by the Standard Oil Company has touched this week the lowest price ever reached, the result of a fight against outside dealers.

STEAM AND HOT WATER.

Master Fitters' Convention.

The preparations for the sixth annual convention of the Master Steam and Hot Water Fitters' Association of the United States, which begins Tuesday of next week at the Broadway Central Hotel, New York, are being rapidly completed, and Secretary Reynolds reports that according to all the promises that are made, it is destined to be a surprisingly large and successful gathering. No one needs to be informed that the year just closed has been a difficult one for the trades, and anything that is adverse to business prosperity is likewise adverse to the prosperity of trade associations. In the West in some ways the depression has been particularly hard upon the steam and hot water fitters, but diminished business has been an unpleasant characteristic throughout the whole country. With these adverse conditions, therefore, it is particularly gratifying to hear that the reports from the members go to show that interest is unabated in the national organization and that the attendance promises to be large.

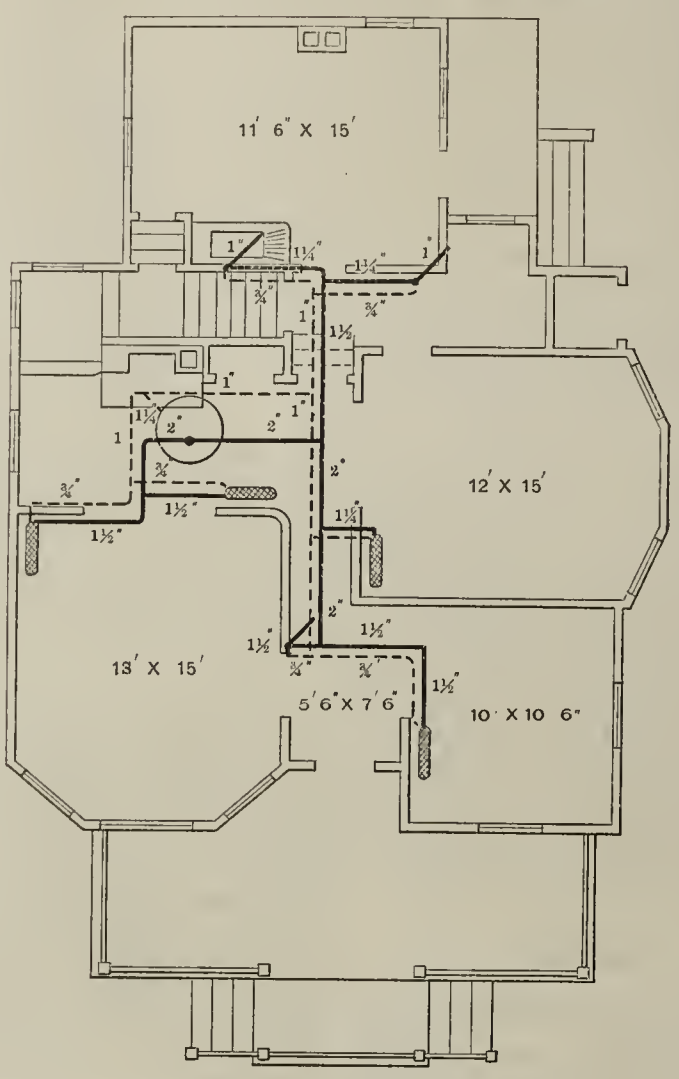
The Broadway Central Hotel is conveniently located, being half way between the downtown trade center and the uptown attractions of the city. One of the best indications of the success of the coming convention is the interest that is being taken by the manufacturers of boilers, supply houses and kindred concerns. It goes without saying that if they did not look for a representative gathering they would go to little trouble to be present or have their goods shown. As a matter of fact already a very large number of applications have been made for space and many prominent concerns will have representatives at the hotel. The following is a partial list of manufacturers who have already made arrangements to be present or represented at the convention:

Jenkins Bros.
American Radiator Company.
U. S. Steam Heater Company.
N. P. Andrus.
A. A. Griffing Iron Company.
Fowler Radiator Company.
Raymond & Campbell Mfg. Company.
Richmond Stove Company.
American Boiler Company.
Boynton Furnace Company.
Thayer Heater Company.
Kennedy Valve Company.
Walworth Mfg. Company.
Fosket & Bishop Company.
Herendeen Mfg. Company.
Gurney Heater Company.
Smith & Anthony Company.
Niagara Radiator Company.
E. F. Keating.
Henry R. Worthington.
Thatcher Furnace Company.
Abendroth Bros.
Crane Company.
H. B. Smith Company.
Fuller & Warren Company.
J. H. McLain Company.
Deane Steam Pump Company.
Page Boiler Company.
Ideal Boiler Company.
Eaton, Cole & Burnham.
Model Heating Company.
Timothy Kieley.
Nason Mfg. Company.
W. C. Mowry.
Wells & Newton.
New York Central Iron Works.

F. T. Davis, Portland, Maine, for the past two years agent for Smith & Anthony Stove Company's Hub heaters in Portland and vicinity, has associated himself with Reuben Westcott and together they will continue to represent the Hub heater.

Small Return Pipes.

We have had opportunity lately to inspect a steam heating plant installed by George H. Murphy, Bound Brook, N. J., in the residence of George B. Stryker of the same place. Mr. Stryker is an architect and contractor, and the plans herewith show the first and second floors of his residence, which was completed during the past winter. Fig. 1 shows the first floor and the location of the radiators and the boiler and the pipes in the cellar beneath. Fig. 2 shows the upper floor and the location of the radiators. The building is exposed on all sides, but has been heated to the entire satisfaction of the occupants. One of the Auburn steam boilers made by F. W. Wright, No. 6 Bridge stores, New York, was used, and the piping, which was run in accordance with the ideas of Mr. Murphy, is a combination of the one and two pipe systems. No return pipe is placed above the cellar ceiling, and all of the radiators are attached by means of a single connection. The return pipe is connected in each case by a tee at the bottom of the riser to the radiator above.



Small Return Pipes.—Fig. 1.—First Floor, Showing Boiler and Piping.

A 2½-inch main is taken from the top of the boiler and a 2 inch branch runs each way from it. The left hand branch merges into two 1½ inch branches, one of which is connected with the hall radiator, which has 44 feet of radiating surface; the other branch continues to the parlor radiator, which has 44 feet of surface also. The other main of 33 feet each, one in each of the front bedrooms. The main in the cellar is continued 1½ inches in size to a 33 foot radiator in the office on the first floor. Directly under the riser which runs to the radiator in every case a ¾-inch return pipe is connected by means of a tee, as shown in Fig. 3. The size of the return pipe where it connects

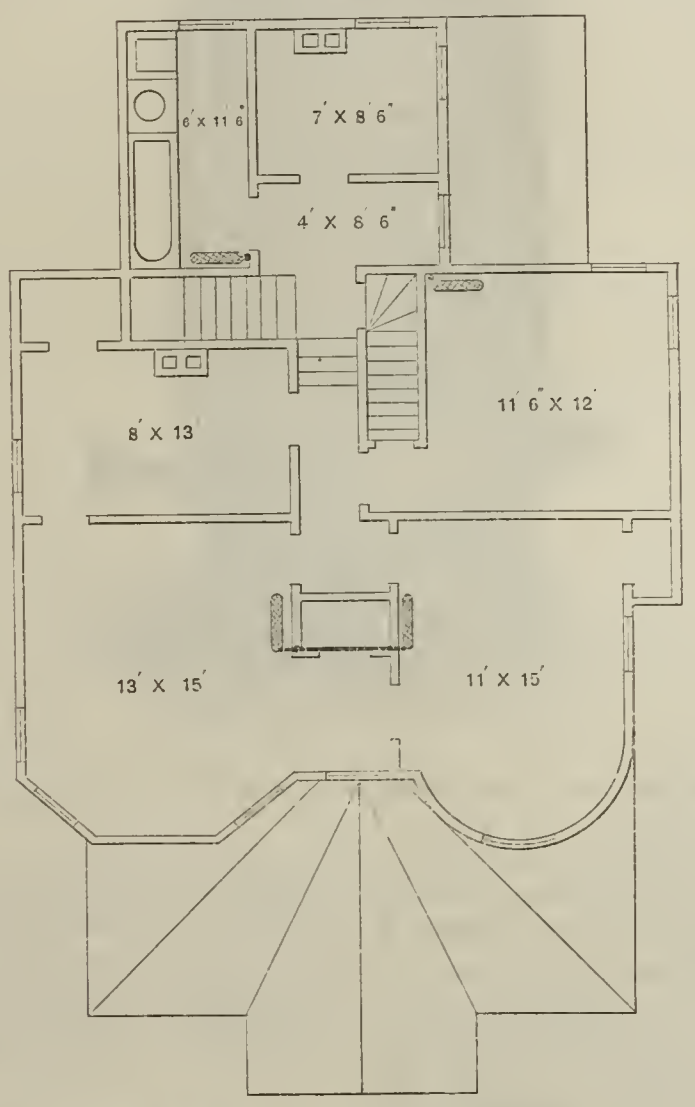


Fig. 2.—Second Floor and Radiators.

branches into a 2-inch and a 1½ inch main, the smaller one running toward the back of the house, branching into two 1¼-inch mains and continuing until a 1-inch riser is taken from each—one to the bathroom radiator, with 22 feet of surface, and the other to the chamber

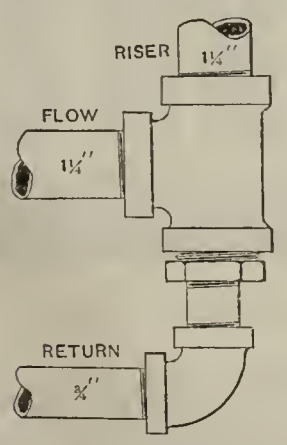


Fig. 3 —Showing Method of Connecting Return.

above the dining room, which has 33 feet of surface. The 2-inch branch main runs toward the front of the house, a 1¼-inch branch being taken off to the radiator of 44 feet of surface in the dining room, and continuing on a 1½ inch riser is taken to the second floor and a 1-inch connection made to two radiators in every case is ¾ inch, and the returns from the parlor and hall radiators continue this size all the way to the heater.

The returns from the bathroom and dining room chamber are ¾ inch up to where they join. At that point they connect with a 1-inch pipe, which runs to a point where it joins with the return from the front of the house. The returns from the front chambers and the office are ¾-inch and connect with a 1-inch pipe where they meet. This 1-inch pipe receives a ¾ inch return from the dining room and runs on and connects with the return from the back of the house, where a 1-inch pipe runs over to the boiler. At the boiler all of the returns connect with a 1¼ inch pipe, which drops down and connects with the heater at the bottom. The flow mains of this job have the usual amount of pitch, but the returns have three or four times as much and no difficulty is experienced in running the system satisfactorily on less than a pound of pressure at the boiler. The use of such small returns is unusual, but is attended with success, to which the sharp decline which they have toward the boiler contributes not a little. Mr. Murphy is a qualified master plumber and has spent several years in large car shops, where in addition to doing plumbing work he worked iron pipe in all shapes, bending it either cold or hot, and through his ability rose to a superintendency of the car heating department. The plant illustrated is but one of many that he can show in successful operation.

Some Generous Comments.

From A. C. Edgar, *Philadelphia.*—In an article appearing in the May number of one of your contemporaries, "Chicago" criticizes the methods of piping a hot water job as shown in *The Metal Worker* of February 10, 17, 24. "Chicago" wishes the reader to understand that all contributors to *The Metal Worker* are not practical, but get their ideas from that great deceiver, theory. The piping proposed by "Helios" in *The Metal Worker* of February 17 is pronounced by "Chicago" "so impracticable that they are not worth mentioning." This statement seems to satisfy "Chicago," but it so seldom occurs that all are of the same opinion that this statement is not satisfactory without some proof of its correctness. "Helios" is a practical engineer with an enviable reputation and generally taken as authority on subjects of this kind, always giving explanations that are satisfactory to practical engineers who recognize that there is frequently more than one way of obtaining the desired results.

"Chicago" claims that "the second opening from the main will not circulate until the first has a good circulation." This is not so, as my practical experience (of less than 30 years) has taught me that it is possible, by taking the openings near boiler from side of main, and others at different angles, as the conditions require, to obtain an equal circulation in all radiators.

"Chicago" criticises several other correspondents in the same strain whose plans have as little need of defense.

The system recommended by "Chicago," which he calls positive, cannot be called good practice, for when in operation the radiators on third floor will be at higher temperature than those on the lower floors, and the radiators on first floor being generally much larger than the upper ones, will give poor results when fed from returns. The valves near ceiling on main return is another objection to this positive system, and carrying the return from lower radiators to ceiling will not allow the free circulation that there would be if returns were carried along the floor. I consider that "Chicago" has neglected the most important part of the job in not giving sizes of pipes and radiators, which, if not properly proportioned, will prove a failure. I know there are few systems that cannot be changed. Often changes are made that increase the efficiency of the apparatus, but many are made simply to satisfy personal fancies. Of all the systems recommended, I think "Chicago's" no better than some, and not nearly as perfect as others. I am not objecting to "Chicago" upholding the system he proposes, but I think he should be more charitable to the lesser lights who venture to express their opinion, by not condemning all systems that do not meet with his approval.

The Model Heating Company, Philadelphia, Pa., announce, under date of June 1, that they have secured the services of M. B. Moore, formerly with the Boynton Furnace Company, who will give his attention to the interests of the Novelty circulator and the Novelty steam generator for hot water and steam heating.

Crane Company's New Valves.

The Crane Company of Chicago and New York have recently brought out some new valves, two of which are herewith illustrated. Fig. 1 is a wedge gate straight way valve, designed for ordinary pressure, for either steam or water, and made in all sizes from 2 to 24 inches. The gate is guided in the body by ribs, which insure true and

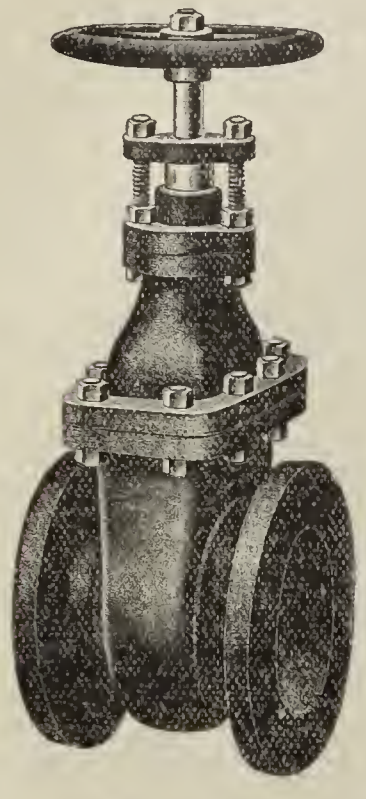


Fig. 1.—The Crane Wedge Gate Straight Way Valve.

easy movement and prevent wear of the faces as well as prevent the disks from touching the seats of the body of the valves except at the point of closing. The seats in the body of the valves and the faces of the disk are made of bronze metal. These valves are furnished with

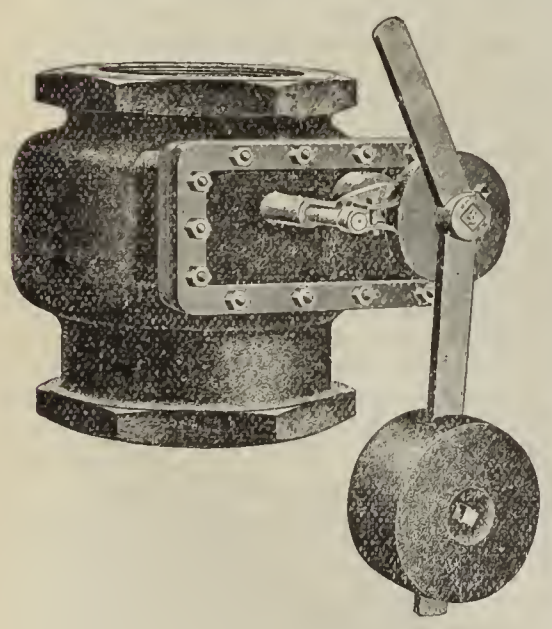


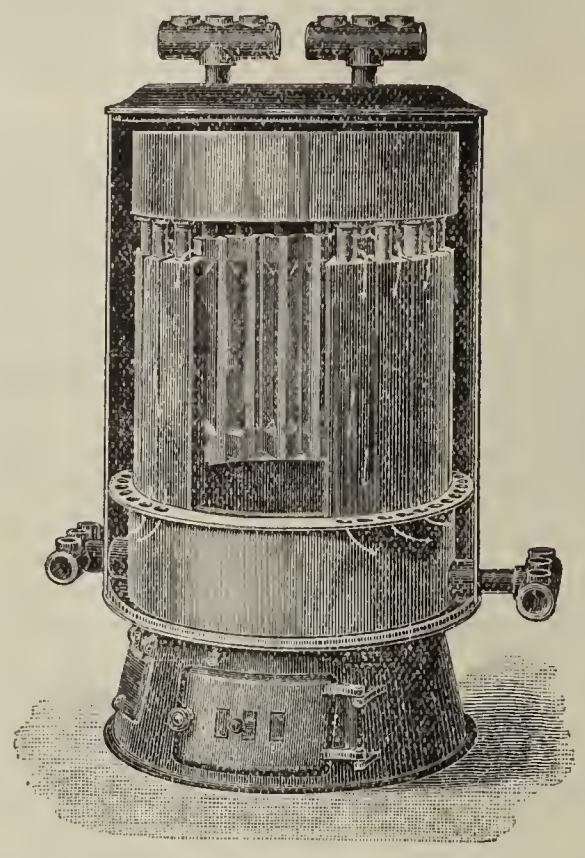
Fig. 2.—The Crane Noiseless Back Pressure Valve.

either screwed, flanged or hub ends, with stationary stem, with outside screw and yoke, with bevel and spur gearing, with gearing and by-pass relief and with indicator. The manufacturers claim many points of advantage for this style of construction and have applied for patent.

Fig. 2 illustrates Crane's patent noiseless back pressure valve for condensing and non-condensing engines. It is constructed with a piston having ports around its sides, the combined areas of which are greatly in excess of that of the pipe. This piston is accurately fitted to the body of the valve, in which it slides freely. When pressure is brought against the under side of the piston it rises, opening the ports just sufficient to let the steam escape, and at the same time it maintains the pressure for which it is set. It has no seat. The opening and closing of the valve are regulated entirely by the weight. This valve was designed to overcome the objectionable and destructive hammering peculiar to the common back pressure valve. Complicated adjustments were avoided, so that it is not liable to get out of order.

Standard Hot Water Heater.

A new form of hot water heater known as the Standard is being placed on the market by Giblin & Co., Utica, N. Y. Fig. 1 is a view of the heater with the casing removed, showing the inner construction, while Fig. 2 is an illustration of the water sections forming the portion of the boiler between the fire pot and upper drum. The heater is made entirely of cast iron, with the exception of the nipples. The construction, as indicated, is vertical, so that the water has a free and clear passage, and it is pointed out that the water goes into circulation as soon as it passes over the hottest surfaces. Another point alluded to is the way the water is spread over a large surface in sheet form so as to effectively absorb the heat of the fire. The boiler proper consists of a water space fire pot into which are screwed a number of vertical sections, forming a large combustion chamber. A water space reservoir forms a large crown sheet surface over the fire, and is connected to the ends of the vertical sections by nipples of sufficient length to permit the products of combustion to pass out and downward in contact with the entire outer surfaces of the sections and of the fire pot. Fig. 2 is an illustration of the water sections used in the Standard boilers. These sections, occupying a vertical position in the boilers, are designed to give easy circulation



The Standard Hot Water Heater.—Fig. 1.—View of Boiler with Casing Removed.

and to readily absorb the heat. Each of the sections presents a large surface to the direct rays of the fire and at the same time holds comparatively little water. The surfaces of the sections are T-shaped, so that when a number of them are arranged in a circle with narrow ends to the fire, a very large fire surface is the result. It is pointed out that the

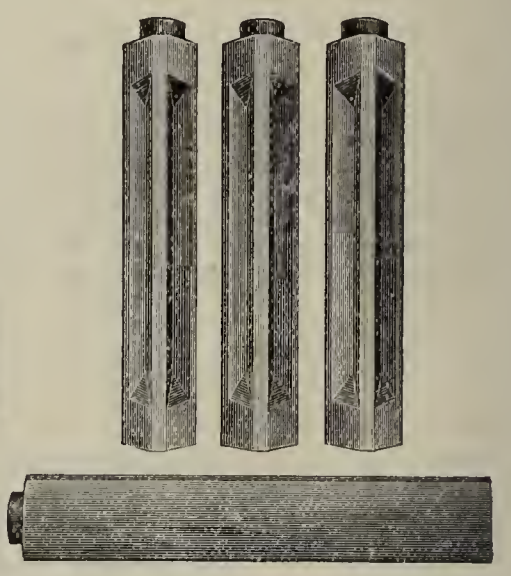


Fig. 2.—View of Sections.

surfaces being vertical do not collect dirt. They are connected with the fire pot by short nipples and are screwed down tight to it, the fire pot and sections each taking one-half of the nipple. The tops of the sections are formed like hexagon shaped nuts, so that one or more of them may be readily removed and others inserted in case of accident. A special feature to which the manufacturers direct attention is the down draft. They claim to have improved the ordinary application of this principle by adding a perforated ring plate which rests on and is on

a line within the top and outer surface of the fire pot, Fig. 1, and serves to distribute the draft uniformly over the outer boiler surface. This distribution is accomplished by having the smallest holes in the plate directly over the indirect smoke collar, which serves to prevent a direct down draft at that point, and the holes are graduated in size so that in the front of the boiler the largest holes in the plate are found. The entire upper section of the combustion chamber, it is pointed out, is thus kept hot and the drafts traveling through the perforated plate pass below the plate and outside the hollow fire pot, thus inclosing it between the fire itself and the heated products of combustion. The Standard hot water heater is made in three sizes: Diameter of fire pot 15, 20 and 24 inches; adapted to supply from 350 to 1200 square feet of direct radiation. These boilers are used for both steam and hot water, the only change being in the size of the reservoir and the trimmings.

HEATING NOTES.

THE RAYMOND & CAMPBELL MFG. COMPANY, Middletown, Pa., have received the contract from one of the largest jobbing houses in Paris, France, for supplying their Lindemuth Sun (steel) steam and hot water boilers. The French company have branch houses in most of the leading cities throughout France, and in their agreement they ask for the entire control of this boiler for France, which offer, we understand, the company have about decided to accept.

HOME COMFORT RADIATORS, manufactured by Reuben Westcott, successor to the Portland Heater & Radiator Company, Portland, Maine, are now made for either hot water or steam. A change in form also has been made, substituting a flat top for the old style. A feature of this radiator is a projecting base and a nickel rail foot rest designed to take the place of an open grate for warming the feet.

WE ARE INDEBTED to the American Radiator Company, Chicago, Ill., of which J. A. Goodrich, 92 Centre street, is New York manager, for a copy of their new pocket catalogue, illustrating the various styles of radiators manufactured by them. It conforms to the excellent taste and style that distinguish the work of this concern, the catalogue being an end opening publication 7⅓ inches long and 4⅓ inches wide, bound in black with silver lettering. The title pages gives the name of the concern and the addresses of their Chicago, New York, Boston, Minneapolis and Denver offices, a list of their officers and directors and the location of their factories at Detroit and Buffalo. In directing the attention of the trade to the contents of this little pamphlet they point with pardonable pride to an assortment of radiators which they say has resulted from an experience covering a period of more than a quarter of a century. They emphasize the fact that the loops of the American radiators contain the full area of heating surface claimed and are arranged to give the most effective results. The volume is divided into three parts, the radiators illustrated on pages 6 to 38 being manufactured at their Pierce plant, at Buffalo; those on pages 40 to 54 being manufactured at their Detroit plant, Detroit, Mich.; while those on pages 57 to 87 are made at their Michigan plant, Detroit, Mich. The extent of the line of radiators made by this company is well understood by the trade and needs no particularizing here. At the end of the pamphlet are directions for decorating, telegraphic code, &c. The printing is done in black and red and high grade paper makes a fine display of the engravings and of the type.

AT A RECENT MEETING of the Sperl Heating Company, Carbondale, Pa., drafts of proposed buildings were submitted by their engineer. They are to be of the slow burning mill construction style, and bids will be asked from builders as soon as specifications are completed. The company now have space in another manufactory, where their workmen are making three sizes of boilers and patterns for another size are nearing completion.

A MAMMOTH POSTER is sent us by the Herendeen Mfg. Company, Geneva, N. Y. The feature of the sheet is a sectional view of the Faultless Furman hot water boiler, lithographed in colors. The construction of the boiler is clearly shown and the course of the water currents and products of combustion indicated.

THE RAYMOND & CAMPBELL MFG COMPANY, Middletown, Pa., manufacturers of the Lindemuth Sun (steel) steam and hot water boilers, will have one of their boilers on exhibition at the coming convention of the Master Steam and Hot Water Fitters' Association, which is to be held on the 18th, 19th and 20th of this month at the Broadway Central Hotel, New York City. H. H. Lindemuth, their mechanical engineer, will be in charge of the exhibit and will be glad to meet all the friends and customers of the company, and will no doubt take pleasure in explaining the many interesting features of his boiler, even to those who are not at present patrons of the company.

THE RICHMOND HEATERS are the subject of description and illustrations in two pamphlets that have been received. The catalogues, of convenient size, are bound in scarlet paper and give full illustrations and descriptions of the extensive line of Richmond heaters. One of these pamphlets is issued in the interest of Webster & Meathe, Detroit, and the other carries the name of George T. Barnes, Newburg, N. Y.

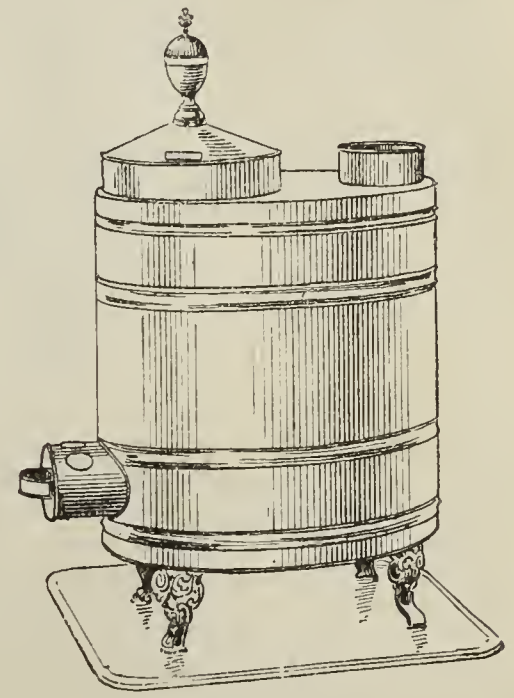
THE SMITH & ANTHONY COMPANY of Boston will be well prepared to meet their friends at the steam fitters' convention in New York next week. They have secured one of the best spaces at the Broadway Central, just at the left of the staircase in the basement. There they will show samples of the Hub steam heater and Hub hot water heater, and their representatives in attendance will welcome the trade. They have also secured parlor No. 357, where they invite all their friends to call and make themselves at home.

B. H. ROSE has accepted a prominent position with the American Boiler Company and will be located in their Chicago office. Mr. Rose is well known in the trade, having been connected with the Hardware business for the past 20 years. He has resigned his office as treasurer of the Pullman Sash Balance Company of Rochester, N. Y.

The condition of depression into which the business of the United States fell in the latter half of last year is clearly illustrated in the report of the Chamber of Commerce of this city, just issued. The Clearing House exchanges for 1893 are therein stated to have been no less than $5,649,367,056 under those of the previous year, and the lowest in amount since 1888. The value of the imports of foreign merchandise in 1893, exclusive of coin and bullion, was nearly $100,000,000 less than the total for 1892, while exports in the same period showed a comparative decrease of $63,000,000.

Cole's Air Tight Heater.

The accompanying cut represents a general view of what is known as Cole's Air Tight Heater, now being manufactured by Cole & Cole, 41 Main street, Council Bluffs, Iowa. This stove is constructed with a view to using wood, cobs and, in fact, all kinds of light fuel. It is made of sheet metal lined with sheet steel, and has a separate collar in the lining of the stove which thoroughly protects the draft opening.



Cole's Air Tight Heater.

The makers are offering this stove in three sizes and two styles, using smooth iron in the cheaper and Russia iron in the higher styles. The length of wood which can be burned is indicated by the numbers of the stoves. It is claimed that the Air Tight Heater will hold fire 20 hours using cobs as a fuel, and 48 hours burning wood. When shut up the stove is safe from sparks or fire, as it has no doors to jar open or apertures through which fire or sparks can escape. The company state that the large size stove will hold 2 bushels of cobs, the combustion of which can be so controlled as to give a steady, slow heat for the period named above.

The popularity of municipal bonds with investors at the present is evidenced by the *Financial Chronicle's* published table of such issues marketed during May. The total amount of sales reported in that month was $14,350,000, a considerable increase on any monthly sales this year, and exceeded only once since the establishment of the record. The high prices paid, too, were remarkable. Several cities have placed their bonds on more favorable terms than they have ever been able to secure before.

The revenue of Canada for the month of May shows a falling off of over $500,000, as compared with the corresponding month last year. The decrease for the ten months of the fiscal year is over $13,000,000.

ROOFING AND CORNICE.

The Country Cornice Shop.

X.

BY CORNICE WORKER.

Patterns for Y-Branches, Round Pipes.

In Fig. 98 is shown the method of connecting two molded eave troughs with one leader by means of a Y-branch. in case the leader is frozen tight at the bottom.

The method of obtaining the patterns for the Y is shown in Fig. 99. The first step is to draw correctly the plan and elevation of the Y-branch, having them in their relative position to each other as shown in Fig. 99.

Let C¹ D E F G, Fig. 99, represent a front elevation of a Y-branch, corresponding to any given angle, shown by B C D E F, Fig. 98, and let B, Fig. 99, be the plan view of the larger pipe and A and C the plan views of the two smaller pipes. It will be noticed that the angles of the Y, as shown by C¹ D E and E F G, are both alike, and therefore only one set of patterns is required. It will be noticed that the smaller pipe C, Fig. 99, abuts against the larger pipe B in plan, the centers being in one line. Now, if the center points of the pipes were placed to one side of each other, the principles used in obtaining the patterns would still be the same. To obtain the pattern for the Y-branch, as shown by the plan and elevation in Fig. 99, proceed as follows: Divide the smaller pipe C in plan into any number of parts, as shown by the small figures, and have the seam to be placed as shown at A¹. Now at right angles to the line

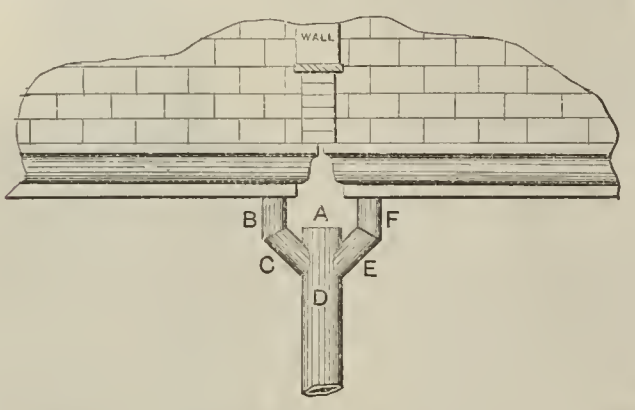


Fig. 98.—Method of Connecting Two Molded Eave Troughs by Means of a Y-Branch.

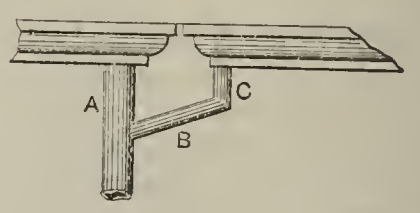


Fig. 100.—Method of Connecting Two Eave Troughs with a Leader by Means of a T-Joint.

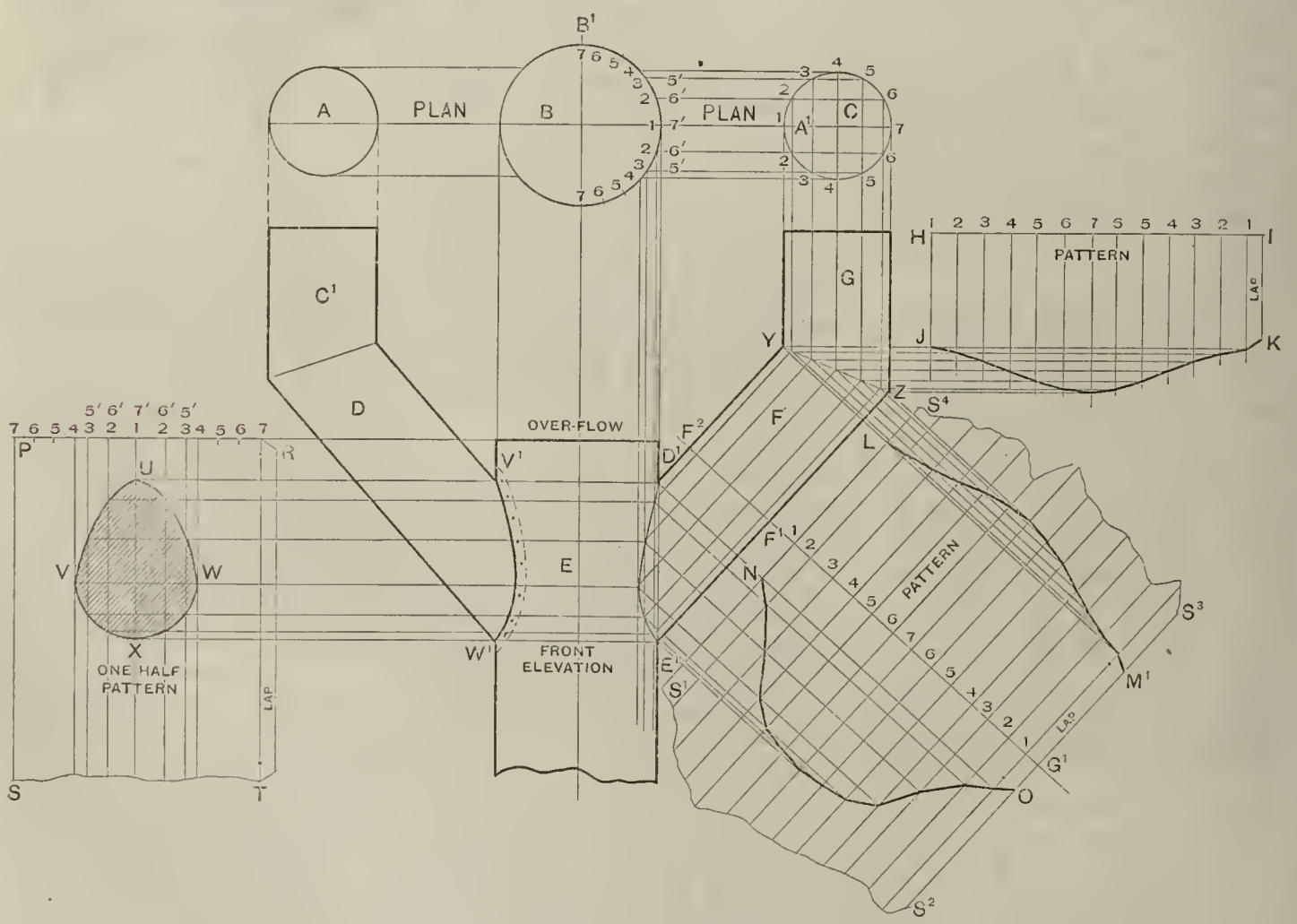


Fig. 99.—Development of Pattern for a Y-Branch Made of Round Pipe.

THE COUNTRY CORNICE SHOP.—PATTERNS FOR Y-BRANCHES MADE OF ROUND PIPE.

E B¹, Fig, 99, draw lines from the small figures on the circle C, intersecting the larger circle or center leader B, as shown by the intersections 4. 3 5′, 2 6′ and 1 7′, &c., corresponding in number to 4, 3 5, 2 6 and 1 7, &c., of the smaller circle C. Parallel to the line B¹ E drop lines indefinitely from the intersections on the plan B, as shown. Now from the spaces obtained on the plan C, Fig. 99, drop lines parallel to B¹ E intersecting the miter line of the elevation Y Z. From the intersections obtained upon the miter line Y Z draw lines parallel to the lines of the pipe Y D¹ or Z E¹ intersecting the perpendicular lines of corresponding numbers dropped from the intersections on the plan B. A line traced through these intersections, as shown from D¹ to E¹, will be the required miter line from which to obtain the measuring points for the pattern. For the pattern for that part of elbow shown at G proceed as follows: At right angles to B¹ E draw the stretchout line H I, upon which place the stretchout of the smaller pipe C, as shown by the small figures on the line H I. Now at right angles to H I, or parallel to B' E, drop lines indefinitely from the small figures, as shown, which intersect with lines of corresponding numbers drawn parallel to H I from the miter line Y Z. A line traced through these intersections, as shown from J to K, will be the required miter cut; or H J I K will be the required pattern for that part of elbow shown at G, Fig. 99. A lap is allowed for riveting, as shown. To obtain the pattern for that part of the elbow shown at F, and intersecting the larger pipe E, proceed as follows: At right angle to the line of the pipe E¹ Z draw the stretchout line, as shown by F¹ G¹, upon which place the stretchout of the smaller circle C, shown in plan view, as indicated by the small figures on the stretchout line F¹ G¹.

At right angles to F¹ G¹ draw lines indefinitely through the small figures on the stretchout line, as shown, which intersect with lines of corresponding numbers drawn at right angles to E¹ Z from the miter line Y Z at the top, and from the miter line forming the intersections of the two pipes shown by D¹ E¹ at the bottom. A line traced through these points, as shown from N to O and M to L, will be the required pattern for that portion of the elbow shown at F in front elevation, Fig. 99. In obtaining patterns of this kind it is not always convenient to obtain them with the use of the T-square, as just described. In shop practice the stretchout line is placed directly upon the sheet metal, the measurements being taken from the elevation and placed thereon by means of the compasses or dividers.

To illustrate: Let S¹ S² S³ S⁴, in Fig. 99, represent a piece of sheet iron upon which is drawn the stretchout line, as shown from F¹ to G¹, and through the small figures thereon the usual measuring lines are drawn. Extend the stretchout line G¹ F¹ as shown to F².

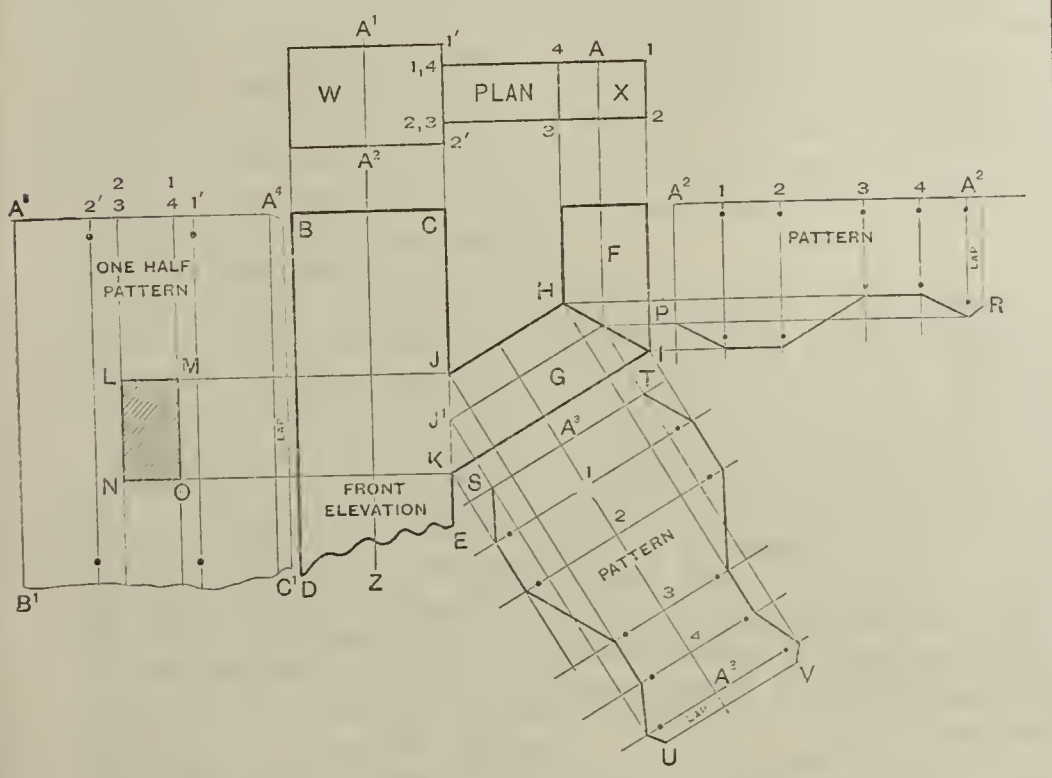


Fig. 101.—*Development of Patterns for a T-Joint Made of Square Pipe.*

THE COUNTRY CORNICE SHOP.

Now measure the distance from the line F¹ F² to where the line 1 cuts the miter line Y Z, and transfer the distance to the sheet metal on the lines 1, 1, measuring from the line F¹ G¹.

Then again measure the distance of the line 2, commencing on the line F¹ F² in elevation, to where line 2 intersects the miter line Y Z, and transfer this distance upon the line 2 2 on the sheet metal, measuring from the line F¹ G¹. In this way all the points will be transferred to the sheet metal, thus completing the pattern N O M L, as shown in Fig. 99. A lap for riveting is allowed, as shown. To obtain the pattern for the opening D¹ E¹, Fig. 99, proceed as follows: At right angles to B¹ E draw the line P R indefinitely, upon which place one-half of the stretchout of the larger circle B, as shown by the small figures from 7 to 7 on the stretchout line P R. It will be noticed, by referring to the plan, that the spaces 1 and 7 of the smaller pipe C intersect the larger pipe B on one line, and is indicated on the profile B, as shown by 1 7′. In the same manner do the spaces 2 6 and 2 6 and 3 5 and 3 5 of the circle C intersect the larger circle B on separate lines, and are indicated on the profile B by 2 6′, 2 6′ and 3 5′, 3 5′ respectively. Therefore are the figures 5′, 6′, 7′, 6′, 5′ placed over the figures 3, 2, 1, 2, 3 on the stretchout P R, corresponding to the numbered spaces on the profile B in plan. Now at right angles to the stretchout line, and through as many points in the stretchout as correspond to the points of the smaller pipe C, intersecting the larger pipe B as shown in plan, drop lines from the stretchout P R, as shown, which intersect with lines of corresponding numbers drawn at right angles to B¹ E or parallel to P R from the miter line D¹ E¹. A line traced through these intersections, as shown by U V X W, will be the required opening to be cut in the larger pipe B, and on to which the pipe F shown in front elevation will miter. At V¹ W¹ in Fig. 99 is shown the method of putting a flange on the elbow C¹ D, placing the flange on the inside of the larger pipe E, either soldering or riveting, as shown.

It will be noticed that P R S T in Fig. 99 represents but one-half of the larger pipe B, as shown in plan. After the half pattern is completed as shown, and the opening U V X W cut out, turn over the pattern on the line P S and trace the pattern on the other side, including the opening U V X W, omitting the lap shown from T to R, which will then be the complete pattern desired.

Patterns for T-Joints, Square Pipes.

In Fig. 100 is shown the method of connecting two eave troughs into one leader by means of a T-joint. In Fig. 101 is shown the plan and elevation of a T joint, the section of the pipe being square, also the method of obtaining the patterns.

Let B C D E G F, Fig. 101, represent the front elevation of a T joint, made to any given angle, shown by A B C, Fig. 100. Let W represent the plan view of the larger pipe and X the plan view of the smaller pipe; draw the plan and elevation in their proper relative position and let the seam be placed at A¹ in plan for the larger pipe W and at A in plan for the smaller pipe X. Now at right angles to A¹ A² in the plan, Fig. 101, draw lines from the corners of the profile X, cutting the side of the profile W, as shown at 1 4 and 2 3, corresponding to the figures on the corners of the smaller pipe or profile X. As the seam is to be placed at A in the profile X, plan view, as before explained, it will be necessary to obtain this point in elevation from which to obtain the line of the seam on the elbow patterns. Therefore parallel to A¹ Z, Fig. 101, drop a line from the seam A in the profile X, cutting the miter line H I in the elevation. From the intersection obtained on the miter line H I draw a line parallel to the line of the pipe I K, cutting the side of the larger pipe in elevation, as shown at J¹. To obtain the pattern for part of the elbow F proceed as follows: At right angles to A¹ Z draw the line A² A², upon which place the stretchout of the smaller pipe X in plan, commencing at the seam A, as shown by the small figures on the stretchout line A² A².

At right angles to A² A² draw lines indefinitely from the small figures in the stretchout, as shown, which intersect with lines of corresponding numbers draw at right angles to A¹ Z, or the lines of the pipe, from the miter line H I. A line drawn through these intersections, as shown from P to R, will be the required pattern for one arm of

the elbow shown at F. For the pattern of the arm of the elbow shown at G proceed as follows: At right angles to the lines of the pipe K I or J H, front elevation, Fig. 101, draw the stretchout line A^3 A^3 indefinitely, upon which place the stretchout of the smaller pipe X, shown in plan, commencing at the seam A, as shown by the small figures upon the stretchout line A^3 A^3. At right angles to A^3 A^3 and through the small figures draw lines indefinitely, as shown, which intersect with lines of corresponding numbers drawn at right angles to the lines of the pipe J H or K I from the miter line H I at the top, and J K at the bottom. A line drawn through these intersections, as shown by S U V T, will be the required pattern for the arm of the elbow shown at G. To obtain the size of the opening J K which will be cut on to the larger pipe shown by B C D E in elevation, Fig. 101, proceed as follows: At right angles to A^1 Z draw the stretchout line A^4 A^5, upon which place the stretchout of half of the profile W, shown in plan, commencing at the seam A^1, as shown by the small figures upon the stretchout line A^4 A^5, the numbers 3 2 and 4 1 on the stretchout A^4 A^5 corresponding to the numbers showing the intersections of the smaller pipe X on the side of the larger pipe W. At right angles to A^4 A^5 drop lines from the small figures, as shown, which intersect with lines of corresponding numbers drawn at right angles to the lines of the pipe B D or C E from the miter line J K, as shown. A line drawn through these intersections, as shown by L M N O, will be the opening required. A lap is allowed for riveting, as shown. It will be noticed that A^4 A^5 B^1 C^1 represents but one-half of pattern of the larger pipe shown by W in plan. For the entire pattern simply turn over the half pattern on the line A^5 B^1, transferring the dots, as shown, which indicate the bends, and omitting the opening L M N O and the lap for riveting. It should be understood that by placing the elbow F G, Fig. 101, on the other side of the pipe D E C B, a Y joint would be the result, the same as shown in Fig. 99, with the exception that the pipe is round in Fig. 99 and square in Fig. 101.

[THE END.]

The Iron Roofing Trade.

The lively movement in the iron and steel roofing trade caused by orders being placed for shipment to Western points before the recent advance in freight rates has quieted down, and the business is as dull as other branches of the iron and steel industry. Recently quite a number of concerns have engaged in the manufacture of specialties. The Cambridge Roofing Company, Cambridge, Ohio, have added a lot of new improved machinery for the manufacture of galvanized conductor pipe, and are doing a fair business in this line, and other manufacturers of the same material are kept busy, thus helping to keep up a steady demand for galvanized sheets, which are now growing scarce in the market. The demand for roofing sheets and corrugated iron continues fair, and some makers are seeking places where supplies of sheets can be secured, but the majority have enough stock on hand for their requirements and are not inconvenienced by the shortage caused by stoppage of sheet mills due to the coal miners' strike. The Berger Mfg. Company, Canton, Ohio, have recently introduced many new designs in steel ceilings and siding, and other sheet metal working concerns are turning their attention to this class of work.

FLASHINGS.

FRED. HARTMAN, 143 Wells street, Chicago, is to furnish the galvanized iron cornice work for the residence of Charles Niemann, Diversey place; flat building of Dr. G. H. Fricke, Halsted street and Buckingham place; store and flat building of A. H. Rendtorff, North avenue, and Casaretto flats, West Indiana street.

A RECENT ISSUE of the *Times*, published at Bethlehem, Pa., contains an article reviewing the history of the Slatington-Bangor Slate Syndicate of Slatington, Pa. Among other things the article states that the shipments of the company for May of this year were 141 carloads, containing 8336 squares of roofing slate, making a total since January 1 of 20,421 squares. For the corresponding period of last year 10,806 squares were shipped by the syndicate. While the situation is not altogether encouraging there is a fair demand for slate, which indicates more or less building activity in some sections of the country. Nearly all the quarries of the syndicate are running on full time, and the outlook is reported good for a large trade this season.

Building Trades Exhibition a Success.

The first annual Chicago Building Trades and Material Exhibition, which has just closed at the Institute of Building Arts, 63 to 69 Washington street, Chicago, was a success in every particular. A large and constant attendance of interested visitors attested the appreciation with which the exhibition was received by the public, and the 200 exhibitors expressed themselves as very much gratified with the work accomplished. The exhibits covered a wide range of building materials and devices, embracing everything necessary to the health, comfort and convenience of man in connection with the construction of buildings.

Exports of copper during April and in the ten months ending April 30 are stated as follows in the last monthly report of the Bureau of Statistics:

	Ore. 1894. Tons.	Ore. 1893. Tons.
In April	291	3,673
Ten months	23,302	33,008
	Ingot. 1894. Lbs.	**Ingot. 1893. Lbs.**
In April	11,075,135	3,084,407
Ten months	168,898,854	24,411,939

The distribution of ingot during the ten months was as follows:

	1894. Lbs.	1893. Lbs.
To United Kingdom	61,069,038	2,308,259
To Germany	21,164,702	2,863,142
To France	26,619,864	9,769,766
To other Europe	59,427,139	9,261,520
To other countries	617,311	209,252

The Bronson Supply Company, 72 Beekman steet, New York, contemplate establishing a London office for supplying the European and British colonial trade with their line of House Furnishing Goods, and at the same time they are making preparations to represent manufacturers of kindred lines of Hardware. The articles in which they intend establishing a foreign trade will include, besides Hollow Ware, Stamped and Pieced Tinware, Copper Ware, Hardware novelties in the line of Kitchen and Household Utensils, Wooden Ware, Wire Goods and Plated Ware. They will also handle a limited number of standard articles, such as Skates, Locks, Oil, Gas and Gasoline Stoves. The Bronson Supply Company request that manufacturers of the above lines of goods who wish to negotiate for representation abroad communicate with them.

The Dry Closet System.

The Board of Health of Syracuse, N.Y., recently held a meeting to hear reports on the dry closet systems used in their schools, which have been carefully investigated by Health Officer Doctor Totman and a committee from the Heating, Ventilating and Sanitary Association of Syracuse, consisting of William A. Tobin, R. C. McClure, F. H. Moore of the Howard Furnace Company, B. Joseph O'Donnell, E. C. Moses of the J F. Pease Furnace Company, E. P. Bates and Edward Joy. The association's committee came before the board with a statement of what they found in an investigation of Montgomery and other schools of the city.

"Montgomery School.—The vaults for the so-called dry closet system were filled with a putrid mass of night soil and liquid 20 inches deep. Over each of these vaults, two in number, are located the two classrooms of the primary department, each containing 48 sittings and occupied by about 80 scholars. Each of these two rooms are provided with two ventilating exits in the shape of face plates located in the floor. These exits, which open into foul air shafts or chambers to ditch, are connected to and open into the said vaults. In each case one of these face plates exits opens into the foul air chamber directly over the putrid mass of liquid night soil above referred to. All the shafts for drawing foul air from the classrooms of the school open into these two vaults. We found upon examination that in the rooms on the second floor, over the vaults, the foul air ventilating exits were operating contrary to the intention and that they were throwing foul air into the rooms instead of exhausting it. Some of the air being thrown into the rooms had passed through the vaults hereinbefore mentioned. According to statements made by persons in the building these conditions have existed more or less during the past season. The teacher stated that they have been obliged to open the windows to obtain pure air. We were informed by the janitor that he had attempted to burn out the excreta deposits with the aid of oil. He stated that he had used 30 gallons of oil in one vault without success and had failed to consume the matter in the other vaults, using more or less oil."

Their statement of the condition at other schools showed but little difference, and on motion of Commissioner Schwarz the Montgomery School in its present condition was declared a nuisance, and the Health Inspector was ordered to abate it.

The official statistics of imports and exports for the ten months of the fiscal year ending April 30, 1894, show a falling off of $123,500,000 in imports into the United States, as compared with those of the corresponding period of last year. Exports, in the same time, increased over $53,500,000. The figures given are as follows: Imports in 1893, $354,213,427, and in 1894, $230,719,588 Exports in 1893. $701,036,375, and in 1894, $754,606 522.

STOVE TRADE NOTES.

The Richmond Stove Company,

with office and works at Twenty-fifth and Main streets, Richmond, Va., have issued an exceedingly attractive volume of nearly 100 pages, relating to cook stoves, ranges, heaters, hollow ware, grates, fenders, &c. The pages are of large size, permitting the use of cuts of liberal proportions. The descriptive text points out the important features of construction and gives the various sizes in which the goods are made, the dimensions of ovens, diameter of pipe required and prices. The printing is in colored ink, while in connection with some of the heating stoves red is employed to indicate the glow of the fire through the mica sections. The company have made some important additions to their line since the last issue of their catalogue, and the statement is made that in the construction of the goods they use iron made from native ores. Among the goods shown may be mentioned the Improved New Lee cook stove, the Kenmore, New Patron, Piedmont, Seminole, Dispatch, New Gordon, Wenonah and the Virginia Air Tight. The ranges are represented by the Richmond, a substantial six-hole construction of attractive ornamentation made in various styles and sizes; the Lee, shown in several varieties; the Favorite, for brick setting; the Roanoke, Dorcas and Ariel. The heaters include the Sultan, a new direct draft self feeder for coal; the New Avondale; the Melrose, a cottage parlor for wood or coal; the Radiant, an attractive Franklin; the Comfort, a neat Todd for wood; the New Dixie, a box stove; the Longdale, a heavy cannon; the Iron King, shown with and without heating drum; the Richmond Oak, a new heater made in five sizes for wood or coal, and the Pluto, a cannon stove made in four sizes. The closing pages of the catalogue are given up to illustrations and prices of grates, fenders, hollow ware, fire brick, &c. An interesting feature is the presentation of skeleton cuts of a cook stove and range, the various parts being numbered in such a way as to facilitate the ordering of repairs. The binding of the catalogue is in embossed covers, the design appearing in old gold and green upon a wine colored ground.

ODD PLATES.

NEGOTIATIONS have been in progress for some months between Emerson McMillin & Co., 40 Wall street, this city and certain of the large vapor and gas stove manufacturers of Cleveland, St. Louis and Chicago, looking to the acquisition of these properties by the United Vapor & Gas Stove Company, who have recently been organized under the laws of the State of Illinois, with a capital stock of $8,500,000. The negotiations are not yet concluded, but the progress of affairs will be watched with interest by the trade.

QUITE a number of Western stove foundries have been obliged to suspend operations recently because they ran out of coke. The coal miners' strike continued long enough to affect these foundries, but it was a much longer pull than had been expected.

THE FAVORITE STOVE & RANGE COMPANY of Piqua, Ohio, are calling attention to their specialties offered under the name Favorite, by means of a little pamphlet entitled "Col. Tompkins' Story." This is told in verse, illustrated by means of numerous engravings. The printing is in colors, and the style and make up of a pleasing character. The last page of the cover gives a bird's-eye view of the company's works at Piqua.

THE STOVE MOUNTERS of Philadelphia have formed a local union under the jurisdiction of International Union No. 6, and have elected H. G. Halbe president, Jacob P. Rothfuss treasurer, and James P. Donnelly secretary.

THE DETROIT STOVE WORKS, Detroit, Mich., have just made a shipment to Frankfort, Germany, of 35 Jewel base burners, and have an order on file for future shipment of goods to Constantinople.

DR. EDWARD KIRK, 1208 Vine street, Philadelphia, Pa., publishes a neat pamphlet on "Constructing a Cupola," which contains much practical information for those who have need of such a furnace. The pamphlet will be sent free on application to Dr. Kirk.

THE THATCHER FURNACE COMPANY are now settled in their new five-story brick building at 240 Water street, where they enjoy greatly improved business facilities as compared with their old location at 32 Peck slip. On the first and second floors of the building are found an excellent display of furnaces and hot water heaters, while the third floor is set apart for ranges in portable form and brick set. The fourth and fifth floors are given up to workshop purposes. The entire building is lighted by electricity, over 200 incandescent lamps having been installed. During the past week the company have shipped to their agents in the West many carloads of furnaces and ranges.

C. EMRICH of Columbus, Ohio, has recently made some improvements in connection with his Brilliant Florence Round Oak, which is offered the trade in five sizes. He has increased the hight of this stove by extending the drum about 15 inches. The nickel trimmings have also been altered in some respects, giving, it is claimed, much more satisfactory results. Two sizes of a new four-hole range, made right or left hand, have been brought out and the Prize Florence four-hole cook stove, as well as the Queen Florence, have been remodeled. The concern are now fully equipped with a complete line of medium priced stoves of new pattern and modern design.

CHARLES E. COLEMAN, representing Eugene Munsell & Co., 218 Water street, New York, has recently returned from a six weeks' trip through the Eastern and Western States, where he called upon stove dealers, hardware jobbers and manufacturers of electrical goods. We understand that Mr. Coleman will soon visit his many friends in the stove trade in the New England States and also in the State of New York.

THE PORTLAND STOVE FOUNDRY COMPANY of Portland, Maine, have brought out a new medium priced range known as the Ideal Atlantic. It is of attractive appearance, embodies the modern features of convenience and utility and is designed for a leader, to sell in the same class as the highest grade goods, but at a lower price.

THE MAGEE FURNACE COMPANY, 32 to 38 Union street, Boston, Mass., are distributing a unique advertising novelty entitled "The Great Columbus Egg Puzzle." It consist of a round pasteboard box, about 2¾ inches in diameter and ¾ inch deep, in the bottom of which is a small hole. The box contains a wooden egg of such a size that it will go partially through the hole. The puzzle is to make the egg stand in an upright position in the hole without touching it. The bottom of the box carries an inscription calling attention to the puzzle and also to a new range which the company have brought out, known as the Magee Grand. This is referred to as "the finest cooking apparatus that has ever been made." The cover of the box is embellished with a colored picture in which Columbus is a prominent figure.

STUMPF & THIELE, 19–21 North Tennessee street, Indianapolis, Ind., have issued an illustrated circular showing the Tropic base heating steel furnace, for use in residences, churches, halls, stores, &c. It is made in three sizes, known respectively as Nos. 25, 31 and 37. The manufacturers also call attention to their Sanitary school room heater and ventilator, of which two sizes are made. The claim is made that by its use a "constant change of air is obtained in the room by the introduction of a volume of fresh air from outside through the heater, and the ejection of foul air from the room, taken from the lower currents in the room through the ventilators."

THE SANFORD HEATING COMPANY, represented by L. V. Sanford, 113 Beekman street, this city, have been appointed agents for the sale of the goods manufactured by the Kelsey Furnace Company of Syracuse, N. Y. The furnaces of this concern have established a gratifying reputation in the trade by reason of their durability, large, heating surface and economy of fuel. Mr. Sanford has been brought up in the stove business and is considered an authority on matters pertaining to heating and ventilation.

THE MARCH-BROWNBACK STOVE COMPANY of Pottstown, Pa., have just placed on the market a new soft coal furnace as an addition to their well-known line of Crown furnaces. The new furnace consumes its own smoke, this being effected by means of a current of air which is taken in at the front

of the furnace and distributed in the fire. The furnace is made in the three larger sizes and two styles, portable and brick set.

EVANS & Co., formerly located at Peck slip and Front street, have leased the building 119 Beekman street, this city, where they will carry a full line of stoves and ranges manufactured by the Lebanon Stove Works, at Lebanon, Pa., for whom they are agents. The firm also represent Luther & Lederhos of this city, and will carry a full line of their gas stoves and ranges.

MANAGER HULL of H. Rendtorff & Co., Chicago, reports a sale of a carload of stoves for immediate shipment, and all of one kind. There is no doubt about it, for he exhibits the documents to prove it. This interesting event is mentioned because it had been supposed that carload orders were events of the misty past.

THE MAGEE FURNACE COMPANY, Boston, Mass., are sending the following letter to their patrons: "J. Q. A. Butler having severed his connection with our New York branch, our business there will be conducted in the future by J. M. Sweeny as manager, at 242 Water street, as heretofore. Wm. H. Mason will continue in charge of the retail furnace department."

"ONE HUNDRED FROM MANY THOUSANDS," is the title of the Eastern edition of a pamphlet of testimonials relative to Splendid and Stewart stoves, just issued by the Fuller & Warren Company of Troy, N. Y. There are 30 pages of letterpress wholly devoted to these letters, which come from dealers in the Eastern section of the country who have handled the goods named. The communications are of a highly complimentary character and indicate in no small degree the measure of success which the Stewart and Splendid stoves have achieved.

IT MAY have been accidental, but it looked intentional. At all events the buyer thinks so if he now knows the circumstances. During the recent cold spell, which seems ever so long ago, the writer dropped into a store for the sale of oil heaters. One of them was in full blast. Resplendent in nickel, and with the glowing flame showing through the large mica panes, it was a sight to cheer the eyes on such a chilly morning. In dropped a customer who was attracted by the beauty of the stove, and then took a position in front of it so that he could more readily examine its construction. "Jerusha!" said he, "does it throw out that much heat?" "Yes, always," said the gratified salesman, proceeding to dilate upon its superior powers of air circulation. The customer ordered one forthwith and instructed the salesman to send it to his house immediately to comfort his wife, who didn't want to buy more furnace coal and was trying to brave out the discomforts of the late spring. The cause of the buyer's enthusiasm was discovered after he had gone out. He had been standing immediately in front of a register through which a Sturtevant blower was forcing heated air with all the energy of which it was capable, and had evidently assumed that the heat he felt was due to the terrific power of the stove before him. The beatific smile on the salesman's face when he perceived the combination that had so signally aided him was a sight to make a fallen angel weep.

RATHBONE, SARD & Co. have received in their Chicago office, corner of Wabash avenue and Randolph street, the originals of the letters patent covering the construction and design of their Acorn radiator. These patents are dated January 23, 1894, and March 13, 1894, the first covering design and the second construction. They take pleasure in showing these patents to those who are interested in the matter. They will issue licenses to other manufacturers who may wish to use the principle on which this stove is constructed, but retain the design exclusively for their own stoves.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE BOARD OF SUPERVISORS of Ontario County, N. Y., have passed an appropriation of $25,000 for the erection of a Sheriff's residence and jail, which will have a system of heating and plumbing.

THE CONTRACT for steam heating of the new school house at Doylestown, Pa., has been awarded to Thomas Craig of Trenton, N.J. The contract price is $1690.

THE CONTRACTS for the heating, plumbing and ventilating of the two new school buildings at St. Paul, Minn., have been awarded by the Board of Education. The board awarded the contract for the plumbing to W. W. Sykes & Co. for the Van Cleve and Douglass buildings at $1432 each. The contract for the heating and ventilating of the Van Cleve Building was given to Pond & Naset for $5200, and for the Douglas Building to Turnsted & Moore for $5698.

EDWARD H. BARRY has been awarded the plumbing contract for the new Gaulin Avenue School House at Woonsocket, R. I.

THE BOARD OF STATE PRISON COMMISSIONERS of the State of Montana will, until June 28, 1894, receive sealed proposals and bids to equip the Eastern State Prison at Billings, Montana, with steam heating plant. All proposals must be addressed, "Board of State Prison Commissioners, Helena, Montana," and marked, "Sealed Proposals and Bid, by (giving the name of the bidder)." A bond of $5000 will be required of the successful contractor.

THE TOWN MEETING of Springfield, Mass., has appropriated $1000 for heating the Town Hall.

H. A. R. DIETRICH, Bethlehem. Pa., is putting the heating plant in A. L. Colby's new building, Fountain Hill. Mr. Dietrich is also at work on plans for work on several new buildings, and his Hellertown works are busy turning out boilers.

ORANGE, MASS., is to build a new school house to cost $24 700, exclusive of the heating and plumbing. James A. McKenna has the contract.

SEALED PROPOSALS will be received by T. H. Titus, secretary of the Board of Trustees of the Minnesota State Hospitals for the Insane, at the West Hotel, Minneapolis, Minn., until 1.30 p.m., July 6, 1894, for a plant for heating and ventilating the northeast wing of the Fergus Falls State Hospital for Insane; plans and specifications to be submitted by each bidder. Sealed proposals will also be received for plumbing said building. He will also receive at the same time and place bids for heating and ventilating the Administration Building for the Rochester State Hospital for Insane.

THE CONTRACT for supplying the ventilating apparatuses and the steam disinfecting apparatus for the Contagion Hospital has been awarded by the Sanitary Committee of the city of Harrisburg, Pa., to the Raymond & Campbell Mfg. Company of Middletown, Pa. The steam for the disinfecting apparatus will be supplied from a No. 2 Lindemuth steel boiler.

THE ALBERENE STONE COMPANY, agents for the Smith & Anthony Company, 217 Lake street, Chicago, report the following new buildings in which the Hub warm air furnaces are to be placed: Five houses of F. H. Kirkham, Sunnyside avenue and Robey street, Ravenswood; two houses of D. R. Cannon, Ravenswood; residence of H. Neugard, Rogers Park; residence of D. J. Slayton, Argyle Park.

J. J. WADE & SON, 276 Dearborn street, Chicago, are to do the plumbing, gas fitting and sewerage in the Kent Building, corner of Franklin and Van Buren streets; also the plumbing, gas fitting and sewerage in the Hale Building, corner of State and Washington streets. The Wade system of sewerage is to be used in each of the buildings.

AMONG THE CONTRACTS recently taken by the John Davis Company, 69 to 79 Michigan street, Chicago, can be mentioned the following: Steam heating plants for the new school building on Thomas street, and warehouse of A. E. Kent & Sons, Franklin and Van Buren streets; power plant for the New England Engineering Company's electric light plant, at Edgewater. The company have also furnished supplies for the water works at Ottawa, Ill., and several carloads of pipe to be used on the Chicago drainage canal.

KEHM BROS. & MERTZ, 289 East Kinzie street, Chicago, are to install a steam heating plant for the Illinois Condensing Company, Forty-seventh street and Vincennes avenue.

PROPOSALS for heating the North School House in independent school district of Indianola, Iowa, by steam, will be received by E. W. Hartman, secretary Board of Directors, Indianola, Iowa, until June 22, 1894.

STONEHAM, MASS., has purchased and will remodel the Armory Building and put in a steam heating plant.

VICKSBURG, MISS., is to have a new $10,000 school building, with a modern system of heating and ventilation.

THE MARCH-BROWNBACK STOVE COMPANY of Pottstown, Pa., are supplying one of their style B No. 30 Crown steam heaters for William Blackburn's hotel, at Ambler, Pa. Grant, Jenkins & Co. of Lonsdale, Pa., are installing the heating plant.

AMONG the contracts recently taken for plumbing, gas fitting and sewerage by C. J. Boyd, 4725 Union avenue, Chicago, can be mentioned the following: Flat building of Miss McConvill, Emerald avenue and Forty-third street; flat building of D. Lynch, Union avenue and Forty-fourth street; flat building of John Sampson, Aberdeen and Fifty-fourth streets; flat building of James Kennedy, Sangamon and Sixty-fourth streets.

J. H. ROCHE, 210 Thirty-first street Chicago, has the contract for the plumbing, gas fitting and sewerage in the flat

building of Inspector Nicholas Hunt, Monroe and Fifty-eighth streets.

J. J. DOYLE, 6040 Halsted street, Chicago, is to furnish the plumbing, gas fitting and sewerage in the eight-flat building of H. C. Saxe, Halsted and Sixty-first streets.

PROPOSALS will be received until June 20 by the trustees of St. John's Church, Michigan, Ind., for steam heating and also for water heating for St. John's Church and St. John's Parochial School buildings.

The Manufacture of Briquette Fuel.

At a recent meeting of the Institution of Civil Engineers a paper on this subject was read by William Colquhoun. The paper contained a description of the various English and Continental methods of agglomerating slack coal, which has now become an important and increasing industry and opens up an outlet for large quantities of small coal hitherto lost on the pit bank or in the workings. Various agglomerating agents are detailed and their local advantages discussed; the characteristics of good pitch derived from coal tar render that agent, however, in every way the most suitable. By the use of from 8 to 9 per cent. of pitch, slack coal may he agglomerated into a form eminently suitable for storage purposes, water proof, incapable of deterioration on exposure, of cohesion greater than the large coal from which it is derived, and, finally, having calorific qualities nearly equal to large coal. In support of the latter contention the author cites the results of three experiments with English briquettes, which gave 8.41 pounds, 8.77 pounds and 8.99 pounds, respectively, as the weight of water evaporated from and at 212° F. per pound of fuel. The average evaporative power of several of the best Welsh steam coals was 9.33 pounds. Careful experiments made by Mr. Marié on the Paris, Lyons & Mediterranean Railway gave as corresponding figures for three descriptions of French briquettes, 8.88 pounds, 9.15 pounds and 8.68 pounds, respectively.

The mechanical preparation of the coal used in briquette manufacture receives more attention on the Continent than in England, particularly in regard to the washing and subsequent drying of the slack. These operations are necessary in order to render the poorer coals serviceable for the manufacture. The draining and drying appliances in use are described, particularly those of Jacoby of the Molière Collieries, and of Biétrix, the latter being described in detail and instances given of the working cost. The coal and pitch are intimately intermixed by two methods, known respectively as the melted and dry pitch processes, the pitch by the former being melted, sometimes with additions of common tar, prior to its addition to the coal, and by the latter being ground up with the coal in a dry state. Several examples are given of the procedure in each case. In both instances the mixture of coal and pitch is subjected to the action of heat until each particle of coal is covered with a film of melted pitch, and so rendered fit for compression into blocks. In this state the mixture or paste contains from 3 to 5 per cent. of water in order to facilitate the sliding of the particles of coal one on the other during compression.

The machines for compressing the paste are roughly divided into three classes, irrespective of the nature of the power employed. These classes are: 1. Single compression machines, illustrated by detailed descriptions of the Mazeline. Stevens and Dupuy presses. 2. Machines compressing on both sides of the briquette, such as those of the Middleton, Biétrix and Veillon. 3. Machines acting by the tangential pressure of rolls, like that of Fouquemberg and those of the sausage machine type, such as the Bourriez press. Briquettes hot from the press have an inconsiderable cohesion and have to be treated with care in stacking and loading, and arrangements made to keep down the cost of labor. Costs were given of making briquettes in works in England, in the North of France and in Belgium, the cost of labor, fuel, supplies and maintenance, not inclusive of the cost of material agglomerated, being 2 shilling and 1½ pence, 1 shilling and 9 pence and 2 shillings and 6 pence, respectively.

Instances were cited of the suitability of the same process for the agglomeration of charcoal dust, sawdust, coke breeze, friable iron ores and cement.

Southern Pig Iron Freights.—The Queen & Crescent Route has issued east bound pig iron tariff No. 6, effective June 15, giving rates on pig iron in car load lots from Southern furnaces to the following points:

To	From Dayton and Rockwood, Tenn.	Chattanooga, Tenn.	Rising Fawn, Ga., and Fort Payne, Ala.	Birmingham district.
Connecticut (all points)	$5.00	$5.25	$5 50	$5.50
Wilmington, Del	4.27	4 27	4.52	4.52
Maine (all points)	5.00	5.25	5.50	5.50
Baltimore, Md. (rail and water)	3.54	.....	3.50	3.50
Baltimore (all rail)	4 00	4.00	4.11	4 11
Washington, D. C.	3 76	3.76	4.01	4.01
Massachusetts (all points; all rail)	5.00	5.00	5.50	5.50
Boston (rail and water)	3.89	....	3.85	3.85
New Hampshire (all points)	5.00	5.25	5.50	5.50
Elizabethport, N. J.	4.62	4.62	4.87	4.87
*Jersey City (rail and water)	3.54	.....	3.50	3.50
Jersey City (all rail)	4.76	4.76	4.87	4.87
Albany, N. Y	4.44	4.69	4 94	4.94
Elmira, N. Y	4 00	4.25	4.50	4.50
Lockport, N. Y.	3.56	3.81	4.06	4.06
†New York (rail and water)	3 54	.....	3.50	3.50
New York (all rail)	4.76	4.76	4.87	4.87
Rochester, N. Y	3.56	3.81	4.06	4 06
Syracuse, N. Y	3.80	3.69	4.30	4 30
Troy, N. Y	4 44	4.05	4.30	4.30
Utica, N. Y	4.20	4.44	4.70	4.70
Allentown, Pa	4.41	4.41	4 52	4.52
Chester, Pa	4.27	4.27	4.52	4 52
Harrisburg, Pa	3.56	3.56	3.81	3 81
Lancaster, Pa	3.91	3.91	4.16	4.16
Philadelphia (rail and water)	3.54	.....	3.50	3.50
Philadelphia (all rail)	4.41	4.41	4.52	4.52
Pottsville, Pa	4.32	4.32	4.57	4.57
Reading, Pa	4.27	4 27	3 52	3.52
Scranton, Pa	4.20	4.45	4.70	4.70
Rhode Island (all points; all rail	5.00	5.25	5.50	5.50
Providence, R. I. (rail and water)	3.89	.. ...	3.85	3.85

*In addition to above charges the cost is as follows: In lots of 50 tons and less, 60 cents per ton; over 50 tons, 50 cents per ton.

†The above rates cover pier delivery only. Additional charge within lighterage limits is as follows: In lots of 50 tons and less, 60 cents per ton; over 50 tons, 50 cents per ton.

The all rail rate on the Louisville & Nashville Railroad is $5 39 from Chattanooga to Boston. The rate from Big Stone Gap, Va., to Harrisburg is $3.06. To Newark, N. J., it is $4.87 from Birmingham, $4.62 from Chattanooga, and $4.12 from Big Stone Gap. The all rail New York rate is $5.10 from Birmingham, $4.85 from Chattanooga and $4.35 from Big Stone Gap, Va. The all rail rate to Philadelphia is $4 52 from Birmingham, $4 41 from Chattanooga, and $3.91 from Big Stone Gap.

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TRADE REPORT.

The Iron Market.

The question which is foremost with the trade is whether the settlement of the Coal and Coke strikes when effected will lead to a relapse. The principal argument in favor of the maintenance of a range of prices higher than that of spring is that stocks have been pretty well cleaned up. In Iron as in other staples the country was never so bare.

A second point usually raised is that costs have advanced. That is true, but unfortunately the advance is not very large. It seems pretty certain that Coke for delivery during the second half of this year has been sold at $1.25. Since the majority of furnacemen will find their low priced contracts at an end soon, it looks as though that figure might be established.

A third argument is that during the troubles a good deal of work has been postponed, for which material must be bought. We are inclined to believe that this is overrated, since a prolonged stoppage generally kills a good deal of business outright.

Thus far there are few indications to show how matters will turn. For delivery during the next three or four months $11 @ $11.25 is being asked for Bessemer Pig in the Valleys. But buyers have not worked themselves up to that pitch yet, and the situation is not clear. The prices at which Bessemer is held have encouraged preparations to start some outside idle plants and have caused some furnaces which run on Foundry Iron usually to switch off on Bessemer. This looks as though there is a fair profit in the latter.

Chicago appears to be the most active market in some of the leading lines. Our correspondent notes sales of about 20,000 tons of local Coke Foundry, and states that there has been a good deal of activity in Bars. A number of season contracts have been placed, but at low prices.

Throughout the East the demand in every line continues exceedingly slow. In fact, the indifference of buyers in the face of threatened scarcity has been phenomenal. It looks as though no movement in values can be expected until high temperatures in Washington have driven our legislators home.

In the New York market the demand continues moderate, and is covered quite readily at old prices. The new rates of freight go into effect on the 15th. The rail and water rates to leading points from Southern furnaces are still very low. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No 4 (Foundry Forge) is $9.75 @ $10.25.

Advices from Philadelphia indicate that in that market there is a pretty fair demand for low grade Irons at about $10.25 @ $10.50 and of standard brands of Foundry No. 2 X at $11.50 @ $11.75, but it is very hard to get beyond these limits, notwithstanding the comparative light supply and the higher cost incident to higher freights. Consumers, however, show no desire to buy in excess of their own requirements, for which reason sellers are not crowding the market, leaving it to later developments to decide whether prices shall be advanced or not. Quotations for deliveries at Philadelphia or nearby points are about as follows :

Standard No. 1 Foundry X	$12.50 @	$12.75
Standard No. 2 Foundry X	11.50 @	11.75
No. 2 Plain	10.75 @	11.00
No. 1 Soft	11.50 @	11.75
No. 2 Soft	10.75 @	11.00

The special feature of the week in the Chicago district was the marked activity in local Coke Iron. Sales aggregated close to 20,000 tons, and a heavy inquiry continues. The improvement is not ascribed by dealers to any increase in consumption, but to the general anticipation by foundrymen of higher prices on account of the scarcity of fuel and the cleaning up of Pig Iron stocks. They are anticipating their wants much more freely than at any time for the past two years. Furnace companies are, however, not disposed to sell as freely as foundrymen would buy. They are limiting deliveries to the remainder of their care, and in many cases are endeavoring to cut down the quantities desired. Prices are very firm and in some cases an advance is asked and obtained. Southern Coke steadily grows scarcer and prices are stronger. Quotations on Southern brands are now made only on carload lots for immediate delivery. The furnace companies are not disposed to sell for delivery far into the future, in view of the expected increase in cost of production and advances in freight rates. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @	$15.50
Local Coke Foundry, No. 1	11.25 @	11.50
Local Coke Foundry, No. 2	10.50 @	11.00
Local Coke Foundry, No. 3	10.00 @	10.50
Local Scotch	11.50 @	11.75
Ohio Strong Softeners No. 1	13.00 @	13.50
Southern Silvery, No. 1	@	
Southern Silvery, No. 2	@	
Southern Coke, No. 2	10.00 @	10.35
Southern Coke, No. 3	9.75 @	10.00
Southern, No. 1, Soft	10.25 @	10.50
Southern, No. 2, Soft	10.00 @	10.25
Tennessee Charcoal, No. 1	@	
Tennessee Charcoal, No. 2	@	
Alabama Car Wheel	17.50 @	18.00
Jackson County Silvery	15.00 @	16.00

The Pittsburgh market is reported as being absolutely featureless, there being no demand for spot Iron, and nothing doing in the direction of contracts for late delivery. Mill and Foundry Irons are very dull in demand, but prices continue firm. A sale is noted of 100 tons No. 1 Foundry at $11.50, and one of 100 tons No. 2 Foundry at $10.75, Pittsburgh. For close delivery the following prices are ruling:

No. 1 Foundry	$11.50 @	$11.75, cash
No. 2 Foundry	10.75 @	11.00 "

There is a stronger undertone in the Cincinnati market. While there has been little more than a jobbing demand during the week it was more general in this district and from the East and supplies are so much reduced that many of the Southern furnaces are not offering the grades most in demand at any price, and while they have generally sold Nos. 1 and 2 Fonndry Coke Iron to the extent of the demand at previous prices, they demand an advance on No. 3 Foundry. Quotations are unchanged, but are scarcely more than nominal, as follows:

Southern Coke, No. 1	$10.25 @	$10.50
Southern Coke, No. 2	9.25 @	9.50
Southern Coke, No. 3	9.00 @	9.25
Ohio Soft Stone Coal, No. 1	14.50 @	15.50
Ohio Soft Stone Coal, No. 2	14.00 @	14.50
Lake Superior Coke, No. 1	12.50 @	13.00
Lake Superior Coke, No. 2	11.50 @	12.00
Hanging Rock Charcoal, No. 1	17.00 @	17.50
Hanging Rock Charcoal, No. 2	16.50 @	17.00
Tennessee Charcoal, No. 1	13.00 @	13.50
Tennessee Charcoal, No. 2	12.00 @	12.50
Standard Southern Car Wheel	16.25 @	17.00
Lake Superior Car Wheel and Malleable	16.25 @	16.75

An increasing scarcity in No. 1 Foundry, with a tendency to advance the price of this grade, is the only feature of interest in the St. Louis Pig Iron situation. Nos. 1 and 2 Soft Irons are also hard to obtain, but prices are unchanged. Quotations as follows for cash, f.o.b. cars St. Louis :

Southern Coke, No. 1 Foundry	$11.00 @ $11.25
Southern Coke, No. 2 Foundry	10.00 @ 10.25
Southern Coke, No. 3 Foundry	9.75 @ 10.00
Southern Car Wheel	17.00 @ 18.00
Lake Superior Car Wheel	16.25 @ 16.50
Ohio Softeners	14.25 @ 14.50

Metal Market.

Pig Tin.—The consumptive demand for Pig Tin, like that for other metals, has been very tame of late, while port statistics show more or less considerble addition to the surplus supply. Arrivals at foreign ports have also been quite heavy, and while more or less shifting of stock has taken place the visible supply for this country and Europe is kept at about 19,000 tons, or above the average. In other words, there is abundance of Tin on the market. Moreover, there is a growing conviction that the speedy passage of the new tariff bill, which abolishes the duty on Pig Tin, is certain. These causes combined have served to depress prices, which have dropped during the week on wholesale lots to 19.65¢. Jobbing prices for small lots of Straits Pig are still quoted at 21¢ @ 21¼¢ ℔ lb, but the majority of sales have probably been made of late at the lower figure.

Copper.—Recent large sales of Lake Ingot will, it is estimated, involve 25,000,000 lb. Business is, however, again on a very moderate scale, and values are more or less irregular. Nevertheless prices for retail quantities generally maintain the former level of 10½¢ ℔ lb for Lake Ingot.

Sheet Copper.—Although the volume of inquiries for Manufactured Copper has been appreciably larger during the week, but few of them have as yet crystallized into definite business. Purchasing by consumers still continues to be of a very commonplace character and decidedly below the average for this season. Users of Sheet Copper are, like others similarly placed, buying from hand to mouth as the necessities of their daily business dictate. Individual orders placed with manufacturers and dealers are accordingly for

unusually limited amounts. Stocks in consumers' hands are insignificant, and conditions are favorable for a remarkably active demand for the material later on as general business conditions improve. Prices for small quantities of Sheet Copper remain on a basis of 15¢ ℔ lb, with no discount.

Pig Lead.—Buying has not been free or general, but enough business has passed to give the market quite a steady tone. Small lots of American Pig from store fetch in the neighborhood of 3⅞¢ ℔ lb, although a shading of ⅛¢ from that figure has been conceded to small buyers.

Lead Pipe and Sheet.—A fair volume of business is reported by plumbers' supply houses, but the demand for Manufactured Lead still keeps below the normal for this time of the year. List prices are firmly maintained.

Spelter.—The price of Ore has advanced lately, and the market for Spelter has stiffened. Consumption does not, however, show much increase, and jobbers' prices for small quantities remain at the former quotation of 4¼¢. ℔ lb for Western.

Sheet Zinc.—The market is strong at 5½¢ ℔ lb for 600 lb Casks, and 6¢ for single Sheets. Consumption does not expand to any large extent, nevertheless stocks are sufficiently narrow to insure steadiness at the advanced prices, even if a further rise does not take place. In another column will be found the revised Sheet Zinc discount sheet and list of extras issued by the manufacturers.

Antimony.—Except in a jobbing way the movement is very slow, but supplies are well taken up and prices for small quantities remain quite steady at 10¾¢ for Cookson's, and 10¢ for Hallett's.

Tin Plates.—The market for Tin Plates has not improved materially. While orders for future delivery show a slight increase, the movement is still slow for the season. Can makers appear to be postponing to the last moment the filling of their requirements, on the chance of obtaining their material under the lower duty rate. Canners' prospects for this season are referred to as very good so faras agricultural products are concerned, and Tin Plate dealers are in expectation of some good business in this quarter in the near future. Spot business is confined generally to the usual hand to mouth style of orders, but enough of these are passing to keep the trade fairly busy. That consumption throughout the country has increased during the past few weeks is sufficiently proved from the fact that shipments of Tin Plates from the other side in the month of May increased some 60 % over those for April, while it is stated that the amount of stocks in bond in this country showed little or no growth at the same time. Moreover, domestic manufacturers are busy and disposing of their product regularly. Prices are still low and somewhat weak, except for special sizes of which the stocks in bond are limited.

A special cable dispatch from London to *The Iron Age*, dated June 13, reports on the British Tin Plate market as follows: In the Tin Plate market there has been an improved business at somewhat better rates, chiefly three months' futures at full rates. Makers hesitate to book orders for far forward delivery in the face of stiff bids made by buyers for distant future shipments. Bessemer Cokes have advanced about 1½ pence during the week, and larger demand has raised the price of Ternes to 19/ for double box. Black Plate for prompt delivery is at a premium. Stocks at Swansea are 288,000 boxes.

Sheet Iron.—Galvanized Sheets for immediate delivery are scarce and prices are firmer. The same may be said of Black Sheets, especially those of lighter gauges suitable for tinning. The scarcity of fuel having caused the closing down of a number of mills, those which continue in operation are crowded with orders and are unable to quote prices for early delivery. The consumptive demand for ordinary Black Sheets in this district is not excessive, but those adapted for tinning are in very active demand and command good prices. Makers are not yet able to meet the increased demand for this material, but Tin mills are being widely added to existing works, and the productive capacity will within a short time be very largely increased.

Chicago Report.

Scrap.—Dealers continue to quote the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Trade keeps up well, notwithstanding the advance. The scarcity of Soft Coal is severely felt, diverting many consumers to the use of anthracite. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Ch
Chicago, Ill	$5.25	$5.50
Milwaukee, Wis	5.25	5.50
Kansas City, Mo	8.45	8.70
Council Bluffs, Iowa	8.45	8.70
Lincoln, Neb	8.60	8.85
Sioux City, Iowa	8.45	8.70
Aberdeen, S. Dak	8.50	8.75
Dubuque, Iowa	6.55	6.80
Madison, Wis	6.75	7.00
St. Paul, Minn	7.75	8.00
Burlington, Iowa	6.75	7 00
Des Moines, Iowa	8.20	8.45
Davenport, Iowa	6.55	6.80
St. Joseph, Mo	8.45	8.70
Leavenworth, Kan	8.45	8.70
Omaha, Neb	8.45	8.70

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

The American built steamer "El Rio" made the trip from New York to New Orleans last week in 4 days, 17 hours and 28 minutes, breaking all previous records by over two hours.

CONDITION OF THE

Hardware Trade.

THE USUAL FALLING OFF in the volume of business which is noticeable in the middle of June is this year increased somewhat by the prevailing quietness in trade, and as a result merchants and manufacturers refer to business as dull. A good many travelers are home, but there is still a good force on the road. Orders for the most part are carefully assorted and considerably smaller than usual, the trade being careful to restrict their purchases to their actual requirements. There is little new in the matter of prices, and on the general line of Shelf Hardware the market is low and somewhat uneven. Manufacturers, especially in heavy goods, are carefully booking orders for future delivery, realizing that there may a change in existing conditions. The trade are looking forward to a quiet business during the next month or two, but hoping that if tariff questions are settled and financial matters are not disturbed there will be a good trade in the fall.

The following letter from Farwell, Ozmun, Kirk & Co., St. Paul, was intended for use in our last issue, but was received after we had gone to press:

Business is showing the usual impulse of the season to some extent and our jobbers have an increased number of orders, but there is not sufficient increase to bring the volume of trade up to that of May, 1893, and this is true notwithstanding the fact that during May of last year the effects of the panic had begun generally to affect business. The trade is also running along more uniformly than was true earlier in the season, and it is now free from any spasmodic features.

The difference is now but little in the sales of corresponding months of the two years, and by July it is reasonably to be expected that the balance on sales per month will be considerably in favor of the present year. This will certainly be true if the crops come on anywhere nearly as favorable as they now promise.

On the whole the jobbing interests of the Northwest are doing fully as well as expected in amount of trade, and this is to be measured with the fact in view that credits are now more carefully scrutinized than ever before. With anything like fair crops jobbers expect very light losses through bad debts.

Prices have advanced on Nails, and the market is firm at present. As to what will be the more lasting effect of the coal strike on the price of Nails and other staples, it is a matter of speculation, but it is certain that for some time to come the price will be affected to some extent. Prices on Barbed Wire and Tin Plate are firm.

The market here is following the advance on Rope. Collections are up to expectations and are fair for the season.

Advices from Chicago.—The movement in Shelf Hardware continues about the same as reported last week. The present week has opened up fairly well with a good number of orders coming in from traveling salesmen and also in ordinary mail. The month is expected to show up about the same as May, notwithstanding the increased sales during a part of that month on account of the freight flurry. No special change has occurred in prices of either Shelf or staple goods. The Heavy Hardware trade is fair and moves along steadily from week to week at about the same volume. Jobbers are now receiving the benefit of the

failure to make future contracts last spring by the Wagon and Carriage manufacturers. They are coming into the market regularly for their purchases of material, thus contributing their share of swelling the current volume of business. Collections are good and payments are being more promptly made than usual within the regular times fixed for credits.

Notes on Prices.

Wire Nails.—The Wire Nail market continues firm, with a fair though not heavy amount of business. Quotations are well maintained on the basis of $1.10 to $1.15 for carload lots, f.o.b. mill. Small lots from store in New York are held at $1.25 to $1 30.

Advices from Chicago.— Manufacturers are receiving some inquiries, but they are by no means numerous or large. A quiet appears to have set in, which may continue for some time. More factories have shut down for lack of fuel, and a general closing is expected to take place in July as usual. Prices are very firm, on account of the diminished production and increased cost of raw material, as well as advances in freight rates. Quotations now range from $1.20 to $1.25, Chicago, for factory lots. Jobbers quote $1.25 for small lots from stock, and report a fair trade, but no call for carload lots.

Cut Nails.—There has been comparatively little change in the Cut Nail market for several weeks, this line not advancing in sympathy with Wire Nails as much as the manufacturers would desire. There is active competition among the mills for such business as is going, and some Western companies are looking aggressively after business in the East, which has the effect of keeping prices lower than they would otherwise be in the territory of the Eastern mills. The demand is fair and the aggregate of orders considerable, although the trade are not buying very freely nor in excess of their actual wants. Sales have been made of Western Nails during the past fortnight at figures which, taking into consideration the present cost of production, are lower than have previously been made. Eastern mills are quoting 95 cents to $1 for Nails delivered on dock in New York. The store price for small lots in New York is $1.10 to $1.15.

Advices from Chicago.—The market looks a little firmer. Sales are being made for immediate shipment and manufacturers are not attempting to make contracts for future delivery. Concessions are now refused, and extreme rates current a short time since have been completely withdrawn. Prices quoted by Wheeling manufacturers are higher, but local rates continue at 90 to 95 cents on 55-cent average, with a very fair volume of business reported for the week. Jobbers are having only a light trade in Cut Nails, but continue quotations for small lots from stock at $1.10 to $1.15.

Barb Wire.—The Barb Wire market is quiet and without new features of importance. The following quotations for Four-Point Galvanized Wire, delivered at the points named, represent the market: Pittsburgh, $2.10 to $2.15; Cleveland, $2.15 to $2.20; Cincinnati or Allentown, $2.20 to $2 25; Chicago or New York, $2.25 to $2.30.

Advices from Chicago.—Manufacturers of standard Wire have advanced their quotations 5 cents per hundred on account of advancing freight rates and higher cost of raw material. The local makers are still behind in their shipments, but new business shows a marked falling off and is expected to be quiet for some time. Mills generally will be closed for repairs during July. Prices are therefore expected to be maintained at rates now fixed. Plain Wire shows a steadily advancing tendency. Jobbers are having a light trade from stock. Quotations are continued on Galvanized Barb Wire at $2.35 to $2.40 for small lots and $2.20 to $2.25 for carload lots.

Cordage.—The demand is very fair and business is quite active considering the season. The recent advance of ¼ cent per pound in Manila, Sisal and New Zealand has been maintained and the market is characterized by a strong tone. Quotations for large lots, f.o.b. factory or New York, are as follows, subject only to a discount of 1½ per cent. for cash.

	Cents.
Manila, base	7
Sisal, "	5
New Zealand, base	5

Sheet Zinc.—Matthiessen & Hegeler Zinc Company, La Salle, Ill., issue a revised discount sheet under date of May 28. The base price, $4.50 per 100 pounds, continues unchanged, but revised discounts are announced as follows:

Discounts.	First class. 15 600-pound casks and upward.	Second class. 10 to 14 600-pound casks.	Third class. 5 to 9 600-pound casks.	Fourth class. Under 5 600-pound casks.
	Per cent.	Per cent.	Per cent.	Per cent.
Special	7	7	7	7
Cash with order	3	3	3	3
Quantity	3	2	1	0
Totals	13	12	11	10

Under date of May 30 they issue another circular in which changes in the extras, in cents per 100 pounds, are announced as follows, the discounts mentioned above remaining unchanged:

Nos.	5	6	7	8	9	10	11	12	13	14	15
32 to 40 x 84	70	40	25	05	.....	.....	.....	.....	.....	.....	.....
32 to 46 x 84 to 90	....	....	....	....	none	none	none	none	none	none	none
52 x 84	....	....	210	90	75	60	40	40	40	40	45
50 x 84	...	....	140	70	50	30	20	20	20	25	25
48 x 108	....	....	110	80	65	45	20	20	20	25	25
48 x 96	....	....	90	40	35	15	15	15	15	15	15
48 x 84	230	125	75	25	20	05	05	05	05	05	05
36 x 108	150	130	70	35	30	20	20	20	20	20	20
36 x 96	125	60	35	20	15	05	05	05	05	10	10
30 x 84	100	65	45	25	15	15	15	15	15	15	15
28 x 84	110	75	55	30	20	20	20	20	20	20	20
26 x 84	130	85	65	40	30	25	25	25	25	25	25
24 x 84	140	100	80	20	15	05	05	05	05	05	05

The extra on No. 4 36 x 84 is $1.25 per 100 pounds.

Double Tank Thermometer Churn.—R. M. Ball, Muncie, Ind., is manufacturing this article, which was described in *The Metal Worker* June 9. The Churn is sold to the trade at $42 per dozen, net, f.o.b. Muncie.

Scrapers.—The Scraper which is being introduced by Harris E. Thomas, Lansing, Mich., an illustration of which was given in our last issue, is sold at $2 per dozen, or $20 per gross, net.

Telephones.—The Telephone outfit described in *The Metal Worker* June 7, and manufactured by Robert H. Ingersoll & Brother, 65 Cortlandt street, New York, is sold at $7.50, subject to a discount of 33⅓ per cent.

Glass.—Local Glass trade is reported as being light, while from Glass centers we learn that Glass is in fair demand. Prices continue firm, and manufacturers as a rule are not making concessions to induce trade. Factory quotations in car lots are reported from Pittsburgh as follows: Single strength, 80 and 10 and 5 per cent. discount; double strength Glass, 80 and 20 per cent. discount. French window Glass is reported firm at 80 and 10 per cent. discount for single or double strength, in any quantities. Plate Glass is in fair demand, the imported article being quoted at 70 and 10 per cent. discount.

Old Metals.—The demand for Old Metals moves slowly and prices continue on their former low level. The following quotations represent about the prices paid by New York dealers:

Heavy Copper	₩ lb	6¾¢
Light and Tinned Copper	₩ lb	6 ¢
Heavy Brass	₩ lb	4½¢
Light Brass	₩ lb	3¾¢
Lead	₩ lb	2½¢
Tea Lead	₩ lb	2¼¢
Zinc	₩ lb	2 ¢
No. 1 Pewter	₩ lb	12 ¢
No. 2 Pewter	₩ lb	6 ¢
Wrought Scrap Iron	₩ gross ton	$8.00
Heavy Cast Scrap	₩ gross ton	7.00
Stove Plate Scrap	₩ gross ton	3.50
Burnt Iron	₩ gross ton	2.50

Old Rags, Paper, &c.—The market for these materials continues very quiet and prices rule low. The following are the current rates paid in New York for Old Rags, Paper, &c.:

No. 1 White Rags	₩ lb	3¼	@	3½¢
No. 2 White Rags	₩ lb	2	@	2¼¢
Mixed Rags	₩ lb			¾¢
Blues and 3ds	₩ lb	1	@	1¼¢
Hard Sized White Shavings	₩ lb	2½	@	2¾¢
No. 1 White Book Shavings	₩ lb	1¾	@	2⅛¢
No. 2 White Book Shavings	₩ lb	1⅛	@	1½¢
Light Book Shavings	₩ lb			¾¢
No. 1 Mixed Shavings	₩ lb	1	@	1¼¢
No. 2 Mixed Shavings	₩ lb	¾	@	1 ¢
No. 1 Printed Books	₩ lb	1	@	1¼¢
Ordinary Mixed Books	₩ lb	½	@	¾¢
Newspapers	₩ lb			2-5¢
No. 1 Manila Paper	₩ lb	¾	@	1 ¢
No. 2 Manila Paper	₩ lb	⅝	@	¾¢
Bogus Paper	₩ lb			½¢
Common Paper	₩ lb			⅜¢
Straw Chips	₩ lb			½¢
Binders' Clippings	₩ lb			½¢
Jute Butts	₩ lb	1⅞	@	2 ¢
No. 1 Jute Bagging	₩ lb	1	@	1¼¢
Mixed Bagging	₩ lb	¾	@	1 ¢
No. 2 Bagging	₩ lb	½	@	¾¢
Hemp Twine	₩ lb	2	@	2¼¢

Manila Rope	℔	lb 2⅛	@ 2¼¢
Jute Rope	℔	lb 1½	@ 1¾¢
Mixed Rope	℔	lb ⅞	@ ⅞¢

Old Rubber.—The following are about the prices for Old Rubber, delivered in New York, except where otherwise stated:

Car Springs, ton lots, ℔ lb.	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔ lb.	@	.03¼
Rubber shoes, less than carloads, ℔ lb.	@	.03¼
Large Hose, ℔ ton	@	12.00
White Wringer Rolls, ℔ lb.	@	.03¾
White Syringes, ℔ lb	@	.03¾

Trade Notes.

We are indebted to William J. H. Gluck, Baltimore, Md., for a batch of interesting advertising matter relating to the very extensive line of goods that he handles. Two of the larger catalogues relate to leading Stoves, both coal and gasoline; the separate slips call attention to Refrigerators, Ovens, Gauze Door Ranges, Oil Stoves, Sieves and Strainers, Steam Cookers, &c. The separate pamphlets are illustrated catalogues and price-lists of Refrigerators of different sorts and Ice Cream Freezers. The prettiest of the circulars relates to Iron Clad Ware handled by Mr. Gluck.

The Rome Mfg. Company, Rome, N. Y., manufacturers of Rome Seamless Copper Tea Kettles, Tea and Coffee Pots, have opened an office at 92 Walker street, New York City, where they will be represented by A. A. Butler, who will carry a full line of their goods to supply the New York City and Eastern trade.

This week's advertisement of the Excelsior Steel Furnace Company, 38 West Monroe street, Chicago, gives a complete price-list of Register Boxes for first and second floors, outside and inside. The company manufacture and keep in stock all kinds and sizes of such Boxes.

The trade will regret to receive the announcement sent out by the Townley Metal Company, Kansas City, Mo., under date of June 6, of the death of W. F. Beckwith, which occurred on June 5 at Pittsburgh, Kan. Mr. Beckwith was on one of his regular business trips when he was taken ill with malarial fever, which, in spite of every care and attention, terminated fatally.

Under date of May 15 the Rome Mfg. Company, Rome, N. Y., issue a revised price-list of nickel plated and polished copper Tea Kettles, nickel plated and polished copper Range Kettles, nickel plated copper Tea and Coffee Pots.

The plant of the W. F. Washburn Brass & Iron Works, Yonkers, N. Y., was sold under the direction of the receiver, Joseph M. Stoughton, at public auction, June 6, by E. De Forest Shelton & Co., 280 Broadway, New York City. The machinery was sold in many lots, to buyers from Pennsylvania to New Hampshire, thus removing the possibility of the plant being again started at Yonkers.

Merchant & Company, Incorporated, Philadelphia, send out a pretty pamphlet printed in colors, relating to Merchant's Metal Tiles, Star Ventilator and Continuous Roofing Tin. The title of the little circular is "Metal Specialties for 1894."

C. Mackintosh, 61 Beekman street, New York, has been appointed sales agent in New York, Pennsylvania east of Harrisburg and the Northeastern States for the New Philadelphia Iron & Steel Company of New Philadelphia, Ohio, makers of Black and Galvanized Sheet Iron and Sheet Steel.

Apparatus for Electric Welding.

Letters patent for an apparatus for electric welding embodying several new and novel features have been issued to Rudolph M. Hunter, and been assigned to the Johnson Company of Johnstown, Pa. The particular construction employed as an example of the use of the apparatus is that in which it is used for the manufacture of steel rails wherein the feet or chairs are welded to the webs of the girder rail so as to give it additional hight and a self supporting base. This rail construction is well known and has been manufactured by other methods of welding the two parts together. In the processes heretofore used for electrically welding the feet to the web of a girder rail, there was employed apparatus in which the two parts were firmly gripped in suitable jaws, the parts pressed together, and an alternating current of great volume caused to pass through the parts in contact so as to cause the metal to fuse and weld together.

In carrying out the present invention the two parts of the metal to be welded are brought in firm contact and submerged in a liquid, preferably acidulated water. While so immersed a continuous electric current from an electrode in contact with the liquid is passed through the metal parts to be united and back to the source of electrical energy, the liquid being employed as a conductor for the current. In practice the positive current is delivered to the electrode submerged in the liquid and the negative current is delivered to the parts of the metal to be welded. The action of the current causes the decomposition of the liquid, generating gases adjacent to the metal parts in contact to be welded, and this produces such reactions that the portions of the metal in contact with the liquid are instantly brought to a welding heat. In this method of welding a considerably more intense current or one of greater tension is required than in the alternating system before referred to, and the current is preferably continuous in its nature or what is known as a continuous current as distinguished from an alternating current. It might be a pulsating or intermittent current if desired. When the two parts of the metal in contact are fused or brought to a welding heat they instantly unite, forming an integral structure; and this joint may be further strengthened by having the parts which are welded subjected to pressure performed by hydraulic, gravity or steam devices.

In this particular device a traveling support or carriage is provided for the girder rail and suitable clamps carried by the carriage for the feet, whereby the latter may be adjusted in position with respect to the rail while it is held on the carriage. At one place adjacent to the rails or bed upon which the carriage moves the joint between the foot portions and the girder rail is surrounded by a suitable hollow frame through which a liquid is caused to flow to submerge the parts in contact during the electric welding operation. After the welding has been performed the liquid is lowered, the hollow frame is separated, and the rail with its welded foot is moved along to be brought under a hammer or compression device. Simultaneously with the foregoing operation a second foot, previously clamped in position upon the rail, is brought into position so as to be held in the hollow frame and subjected in its turn to the welding operation. By this means the welding and forging or compression operations may be carried on simultaneously but successively with respect to a single part operated on.

News and Notes.

The receivers of the Union Pacific Railroad have concluded to relieve the company of the burden of carrying numerous small branch lines which have no prospect of paying operating expenses. An application has been made to the court asking permission to drop a number of branch roads aggregating about 1100 miles.

The offer of a prize of $50,000 for the invention of the best underground electric propulsion system, to be determined by the State Railroad Commissioners, has been withdrawn by the Metropolitan Traction Company of New York City.

A striking illustration of the value of goods depending on their proximity to market is shown by the railroads in Mexico using mahogany for ties, this valuable wood being there so abundant and difficult of carriage to markets where it is called for.

The waters of the disastrous flood in the Frazer River Valley, B. C., are subsiding, leaving behind them ruined crops, devastated farms, drowned cattle, and even loss of human life. The amount of damage done by the flood is estimated at several million dollars.

A joint conference between the leaders of the Knights of Labor, American Federation of Labor and other labor organizations began in St. Louis on Monday. Its object is to arrive, if possible, at an agreement for harmonious and concerted action in the questions now under agitation.

Three Chinese naval officers attached to the Chinese Legation at Washington are visiting the shipbuilding establishments of the United States, with a view of studying methods of construction for the benefit of their country. They have been making a close inspection of the Philadelphia yards this week.

The Cramps have been ordered to proceed with the work of repairing the damage done to the hull of the cruiser "Columbia" at her recent trial. The work will be done at the League Island Navy Yard, Philadelphia, and will occupy about a month.

The rolling mill operatives at the northern end of the Tuscarawas Valley, Ohio, have not displayed that careful exercise of judgment during the coal miners' strike that has characterized their actions in the past when disturbances of this kind occurred. While trouble may be fast approaching for themselves they enter freely into those of others. At Canal Dover, Ohio, the rolling mill men of that place and New Philadelphia were ringleaders in an attempt to prevent the militia from going to Cambridge, and on Saturday last formed a parade and marched to Pike Run, south of New Philadelphia, to take part in a mass meeting of miners. The members of the Amalgamated lodges walked 6 miles and back under a scorching sun, but the miners concluded to stay at home and did not avail themselves of the kindly offices of the iron workers, whose action caused much surprise and adverse comment.

Metal and Miscellaneous Prices.

CHICAGO, JUNE 14, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Galland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	@ $5.60
IC, 14x20, 90 lb	@ 5.35
IC, 14x20, 100 lb	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @ 11.50
IX, 10x14, 14x20	@ 7.25
B.V. Grade. IC, 10x14, 14x20	5.75 @ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Hansel and Dean Grades.—

IC. 14 x 20	@ $5.50
20 x 28	@ 11.00
IX. 20 x 28	@ 14.00

Worcester Brand and equal.—

IC, 14 x 20	6.12½ @
IC, 20 x 28	@
IX, 14 x 20	7.62½ @
20 x 28	15.25 @

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—

IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50

Palma.—

IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20	$9.25
Royal, extra. IC, 14 x 20	7.25
Merion, IC, 14 x 20	7.00
Almond, IC, 14 x 20	6.50
Mint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
IC, 20 x 28	12.50

Roofing Plates.

Palm, IC, 20 x 28	@ $11.50
Palm, IX, 20 x 28	@ 14.00
Empire, IC, 20 x 28	@ 12.00
Empire, IX, 20 x 28	@ 15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated), IC, 20x28	@ $14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 14.75
" IX, 20 x 28	@ 17 25
Westmoreland: IC, 14 x 20	6.00
IC, 20 x 28	12.00
Elwood: IC, 20 x 28	$11 50
Kenwood: IC, 20 x 28	$11.50
Furmston: IC, 20 x 28	$11.00
Juno: IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method: IC, 20 x 28	$17.00
E. L.: IC, 20 x 28	$12.50
Jessie: IC, 20 x 23	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process: IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style: IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ lb 2 3-10¢	3 1-10¢
17 to 20	₩ lb 2 4-10¢	3 2-10¢
21 to 24	₩ lb 2 5-10¢	3 3-10¢
25 and 26	₩ lb 2 6-10¢	3 4-10¢
27	₩ lb 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....13¢ net.

Patent Planished....₩ lb A, 10½¢; B, 9½¢

Craig's Polished Sheet Steel.....dis. 5%

Galvanized.

Juniata or first quality.....8½¢

dis. 75@5%

Copper—

Ingot.

Lake.....10¼¢ @ 10¾¢

Casting Brands.....9¾¢ @ 10½¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ₩ lb additional.

Brazed Brass Tubing. (100 lb lots.)

(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, ⅝ inch up to ¾ inch	.33
Plain, ½ inch up to ⅝ inch	.38
Plain, ⅜ inch up to ½ inch	.41
Plain, 5-16 inch up to ⅜ inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.38
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 lb lots.)

Discount, 40%.

Slab Spelter—

Western Spelter.....4¢

Sheet Zinc—

600 lb casks.....4.50¢

300 lb casks.....4.70¢

Loose sheets.....4.80¢

Lead—

Soft Pig Lead.....4 ¢

Bar.....4½¢

Pipe.....5½¢, dis. 10¢

Block Tin Pipe.....35¢

Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢

Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢

Hallett's.....11½¢

Wrought-Iron Pipe—

1¼ and under, Plain	57½%
1¼ and under, Galv	50%
1½ and over, Plain	67½%
1½ and over, Galv	57½%
Boiler Tubes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	62½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Austin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 square
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 square
Tin	$9.75@$14.25 square
Steel, painted	$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ lb, 2 ¢
" " Brown	₩ lb, 1½¢
" " Purple	₩ lb, 2½¢
" Ground in oil, B. Red	₩ lb, 6½¢
" Ground in oil, Red	₩ lb, 6½¢
" Ground in oil, Brown	₩ lb, 5½¢
" Ground in oil, Purple	₩ lb. 6 ¢
Linseed Oil, Boiled, in oils	54¢@56¢
Linseed Oil, Raw, in bbls	51¢@53¢
Mineral Paints	2@4¢
Orange Mineral	9¾¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.75
Red Venetian in oil; asst'd cans, 8¾¢; kegs	7½¢
Sipe's Japan Oil, in bbls. ₩ gal	$4
Spirits Turpentine, in bbls., ₩ gal	36¢ @36½¢
Asphaltum, Trinidad Refined, ₩ ton	$2..
Tarred Felt, 1 Ply, ₩ 100 lb	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.75
Roofing Pitch, lb bbl. of 300 lb	$3.00

NEW YORK, JUNE 15, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots:

Small lots	₩ lb, 65¢
100-lb lots	₩ lb, 63¢
Ton lots	₩ lb, 60¢

No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:

Small lots	₩ lb, 63¢
100-lb lots	₩ lb, 60¢
Ton lots	₩ lb, 55¢

No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:

Small lots	₩ lb, 60¢
100-lb lots	₩ lb, 55¢
Ton lots	₩ lb, 50¢

Antimony—

Cookson	₩ lb, 10¾¢
Hallett's	₩ lb, 10 ¢

Brass—

Planished.....net

Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per lb.
¾ in. up to 2 in	$0.35
⅝ in. up to ¾ in	.36
½ in. up to ⅝ in	.38
⅜ in. up to ½ in	.41
5-16 in. up to ⅜ in	.48
¼ in. up to 5-16 in	.65
3-16 in. up to ¼ in	1.00
⅛ in. up to 3-16 in	1.50
Smaller than ⅛ in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 16, inclusive,	.38

25 @ 30%

Copper and Bronze Tubing—

8¢ ₩ lb more than brass.

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₩ lb, net

Ingot.

Lake	10½¢
Ansonia Grade Arizona	10 ¢
Ansonia Grade Casting	9½¢

Planished.....net

Sheet and Bolt.....15¢ ₩ lb, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized.....85%

Stove-Pipe—

Buffalo Four-Piece.

4¼	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

20 %

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ lb, 2.50	2.80¢
Nos. 17 to 21	₩ lb. 2.60	2.90¢
Nos. 22 to 24	₩ lb, 2.70	3.00¢
Nos. 25 and 26	₩ lb. 2.80	3.10¢
No. 27	₩ lb. 2.90	3.20¢
No. 28	₩ lb, 3.00	3.30¢
American B. B.	₩ lb, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment.....₩ lb, 11¾@12½¢

Patent Planished....₩ lb, A, 10¢; B, 9¢, 5%

Craig Polished Sheet Steel.....₩ lb 8½¢

Galvanized.

	B. B.
Nos. 10 to 10	
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

75@75&5%

Lead—

American Pig	3¾¢@3¾¢
Bar	4½¢
Pipe	5¾¢, 20%
Tin Lined Pipe	15¢, 20%
Block Tin Pipe	37½¢, 20%
Sheet	6½¢, 20%

Old Lead in exchange, 2¾¢ ₩ lb.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Guards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil: Raw, ₩ gal	.. @ .50
Boiled	.. @ .53
Spirits Turpentine: In bbls	.. @ .30½
Putty: In barrels and ½ bbls	.01⅝ @ .01¾
In tubs	.01¾ @ .01¾
In tin cans	.01⅞ @ .02¼
In bladders	.01¾ @ .02¼
Roofing Material, &c.: Asphaltum, Trinidad Refined, ₩ ton	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ lb	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.	$1.85
Roofing Pitch, ₩ bbl	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

Cast-Iron Soil Pipe, Tarred, sizes 2 to 6 Inches, inclusive.....60@60&10%
Other sizes.....55@55&10%
Cast-Iron Fittings, Tarred, sizes 2 to 6 inches.....60@60&10%
Other sizes.....55@55&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ lb	₩ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra.	4¼	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7¼	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₩ bbl. $1.40@$1.42
Rosin, E. & F.....₩ bbl. $1.45@$1.65
Rosin, G. & H.....₩ bbl. $1.70@$2.05
Rosin, I. & K.....₩ bbl. $2.35@$2.65
Rosin, M. & N.....₩ bbl $2.80@$3.05

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr.....3.70@ 4.00
Peach Bottom, ₩ sqr.....4.75@ 5.60
No. 1 Chapman, ₩ sqr.....3.90@ 4.25
Lehigh Slates, ₩ sqr.....8.00@ 4.50
Vermont:
Sea Green, ₩ sqr.....2.50@ 2.75
Purple, ₩ sqr.....3.50@ 4.50
Unfading Green, ₩ sqr.....3.50@ 4.00
Red, ₩ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼.....13¼@14¢
No. 1.....11¾@12½¢

Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₩ lb.....4¢
Smaller quantities, ₩ lb.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ lb.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 lb, ₩ lb.....3½¢
½ bbls., about 300 lb, ₩ lb.....4¢
Kegs, about 110 lb, ₩ lb.....4¢
75¢ extra for keg.
Kegs, about 55 lb, ₩ lb.....4¢
} 5% dis.

Yager's Soldering Salts.

¼-lb bottles, each.....30¢
Large quantities, per lb.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ lb.....21½¢@22¢
Straits, pigs, ₩ lb.....21¢@21¼¢
Straits in bars, ₩ lb.....22¢@22½¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20.....5.50
" IX, 14 x 20.....6.75
Apollo Roofing, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Atlantic, IC, 14 x 20.....5.75
Bonus, Extra Coated, IC, 14 x 20...6.75
" " " IX, 14 x 20....8.25
Buckeye, IC, 14 x 20.....7.00
" IX, 14 x 20.....8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20.....5.37½
Climax, IC, 14 x 20.....5.50
Columbia, IC, 14 x 20.....7.00
Dane, IC, 14 x 20.....5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20.....5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28.....15.00
Empire, IC, 14 x 20.....5.75
Extra Central, IC, 14 x 20.....5.62½
Flag, IC, 14 x 20.....5.25
Fort Pitt, IC, x 20.....5.75
Freeport (Hand dipped and Resquared). IC, 14 x 20.....7.50
IX, 14 x 20.....8.75
Globe, IC, 14 20 x 28.....11.00
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20.....5.75
Kensington, IC, 14 x 20.....6.75
" IX, 14 x 20.....8.00
Knoxall, IC, 14 x 20.....6.00
Laufman's Apollo (Resquared), IC, 14 x 20.....8.12
Laufman's Apollo (Resquared), IX, 14 x 20.....9.37
Leominster, Extra Coated, IC, 14x20 7.25
Liou (Stamped), IC, 14 x 20.....6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20.....7.00
Maple, IC, 14 x 20.....6.50
Merchant's Roofing (Resquared), IC, 14 x 20.....8.25
McKinley, IC, 20 x 28.....12.00
" IX, 20 x 28.....15.00
Newcastle Real Old Method, IC, 14x20. 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.25
N. F. Old Style, IC, 14 x 20.....7.50
" " " IX, 14 x 20.....9.00
Old Colony, IC, 14 x 20.....8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20.....5.25
Palacio, IC, 14 x 20.....5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20.....8.00
Phœnix, IC, 14 x 20.....5.62½
Scott's Extra Coated (Resquared), IC, 14 x 20.....9.25
Scott's Extra Coated (Resquared), IX, 14 x 20.....10.75
Taylor Old Style (Resquared), IC, 14 x 20.....9.25
Taylor Roofing, IC, 14 x 20.....8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20....6.00
" IX " 14 x 20....7.25
U. S. Monongahela, IC, 14 x 20.....6.10
U. S. Redipped, IC, 14 x 20.....8.25
Venus, IC, 14 x 20.....5.37½
Vigilant, IC, 14 x 20.....5.50
Waldo Redipped, IC, 14 x 20.....6.75
Westmoreland, IC, 14 x 20.....6.25
Wilkinsburg Redipped, IC, 20 x 28.16.00
" " IX, 20 x 28.19.00
Willow, IC, 14 x 20.....6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Climax, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....6.75
Hazel, IC, 14x20.....5.80
Iowa, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Linden, IC, 14x20.....6.50
Merchant's Dipped, IC, 14x20.....11.00
Merion, IC, 14x20.....6.75
Mint, IC, 14x20.....6.00
Newcastle Russia, IC, 14 x 20.....7.00
" IX, 14 x 20.....9.00
Newcastle Juniati, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.50
Newcastle Best Coke, IC, 14 x 20....6.00
" " IX, 14 x 20....7.25
Newcastle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.75
Palma Xtra, IC, 14x20.....7.25
Phœnix, IC, 14x20.....6.25
" IX, 14x20.....7.75
Royal, Extra, IC, 14x20.....7.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Youghiogheny, IC, 14 x 20.....6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$7.50
20 x 28.....15.00
1X, 14 x 20.....8.75
20 x 28.....17.50
Pontymister Grade, IC, 14 x 20.....6.50
20 x 28.....13.00
1X, 14 x 20.....7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20.....$5.75
20 x 28.....11.50
IX, 14 x 20.....6.75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....5.40
20 x 28.....10.80
IX, 14 x 20.....6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20.....5.25
20 x 28.....10.50
IX, 14 x 20.....6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.

Duty: 2.2¢ ₩ lb.

Melyn and Cal-land Grade. IC, 10 x 14.....$6.35
" " IC, 12 x 12.....6.60
" " IC, 14 x 20.....6.35
" " IC, 20 x 28.....12.70
" " IX, 10 x 14.....8.00
" " IX, 12 x 12.....8.20
" " IX, 14 x 20.....8.00
" " IX, 20 x 28.....17.00
" " DC, 12½ x 17.....6.00
" " DX, 12½ x 17.....8.00
Allaway Grade. IC, 10 x 14.....5.75
" " IC, 12 x 12.....5.85
" " IC, 14 x 20.....5.75
" " IC, 20 x 28.....11.50
" " IX, 10 x 14.....7.00
" " IX, 12 x 12.....7.25
" " IX, 14 x 20.....7.00
" " IX, 20 x 28.....14.00
" DC, 12½ x 17.....5.50
" " DX, 12½ x 17.....6.50

Coke.

Steel Coke.—IC, 10x14, 14x20.....5.35
10x20.....8.25
20x28.....11.00
IX, 10x14, 14x20.....6.60
B. V. Grade.—IC, 10x14, 14x20.....5.40

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets).....14.60
IXX, 14x31..(112 sheets).....16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs*

Trucks Stove—

Improved Lock Frame, per doz....$15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₩ doz.....18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....50&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 1892..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 lb casks.....₩ lb 5½¢
Per lb.....6¢

It Is Reported—

Colorado.

That the store of the Holmes Hardware Company, PUEBLO, was damaged by the recent flood in that section to the extent of $10,000.

District of Columbia.

That the Hardware store of Wimsatt & Uhler, WASHINGTON, was visited by burglars on the 3d inst., and about $200 worth of Hardware stolen.

Illinois.

That an attempt was made on the night of the 25th ult. to destroy the Hardware store of J. W. Richards, FERRIS. The flames were, however, extinguished before serious damage was done.

That burglars entered the Hardware establishment of Reeve, Brown & Ward, RUSHVILLE, on the 28th ult., and carried off several hundred dollars' worth of Cutlery and Firearms.

That S. J. Smith, the junior member of the Hardware firm of Miller, Smith & Co., SAVANNAH, has retired from the business. P. Miller will continue it.

That Sullivan Bros., RUSHVILLE, have sold their entire stock of Hardware, &c., to M. P. Agnew of COLCHESTER and Herbert Whitson of MACOMB.

That J. F. Whitaker of the firm of Crane & Whitaker, FARMINGTON, has sold his interest in the Hardware business to W. F. Connell. The firm style is now Crane & Connell.

That W. I. Burnsides has disposed of his interest in the Hardware business of Rouse & Burnsides, ABINGDON, to his partner. Mr. Rouse will continue the business.

That D. T. Bartholomew has sold his Hardware stock, at ROCKTON, to Phelps & Waite, who have taken possession.

Indiana.

That J. H. Reid has purchased John Callihan's Hardware store, at LYONS.

That the Jones Hardware Company, successors to Jones Bros., RICHMOND, have taken possession of their new quarters, which are stocked with a complete line of Hardware, Paints, Iron, Steel, Factory Supplies, &c. The furniture and fixtures are of the most approved style, the former being of natural oak, highly polished. All goods are sampled upon the shelves. Saturday, June 2, was their opening day, on which they welcomed their many friends and customers. In the evening the local band entertained the company's guests. James A. Carr is president of the company, Sharon E. Jones treasurer and general manager, and Clement V. Carr secretary.

Iowa.

That the Stuhr Hardware Company, NEOLA, are making preparations to rebuild their store building in the near future.

That B. Davis & Co. are a new Hardware firm at HAMBURG. They will also conduct a tin shop.

That fire on the 29th ult. destroyed half a dozen establishments in LISBON, including the Hardware and Implement store of A. & G. Rundell.

That John Roeh has bought out the Hardware business of B. Peterson, LYONS. Mr. Roeh's son will manage the business.

That Henry North has disposed of his Hardware business, at BODE.

That O. F. Griffith, MT. PLEASANT, has sold out to Fernald & Co.

That a new Hardware store has been opened at BOONE, by Murray & Haun. Messrs. Murray and Haun are from ESCANABA, MICH.

Kansas.

That Charles Graves' Hardware store, at WASHINGTON, was burglarized on the 27th ult.

Maine.

That J. J. Lander is building an addition to his Hardware store, at BINGHAM.

Massachusetts.

That Leonard Thompson has retired from the Hardware business at WOBURN. Mr. Thompson bought out Kimball & Ladd and entered the Hardware line at WOBURN in 1852, since which time he has been actively connected with it. Mr. Thompson has been succeeded by his son, L. Waldo Thompson, who has for some years managed his father's large and lucrative business, and is thus in a position to conduct it successfully.

That all the Hardware for the new court house building in BOSTON was furnished by the A. M. Gardner Hardware Company of that city.

That Charles L. Woodbury has purchased the Stove and Tinware business of Charles Friend, at BEVERLY.

That Rackliffe & Co., Hardware dealers, have closed their store at NORTHAMPTON and will hereafter confine their attention to the store at Holyoke.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

At once, a good TINSMITH who can do general jobbing and roofing and make up tinware; must be used to country work; good job and good wages to the right man. C. Hoag & Son, Downsville, N. Y. June 16

SALESMEN selling other goods, to sell stoves on commission, in the States of Michigan, Illinois and Iowa; a liberal commission will be paid to the proper men. DeHaven & Co., Limited, Pittsburgh, Pa. June 9

Middle aged man, experienced and competent to take charge of plumbing, steam and hot water heating and gas fitting business; must be of good habits, able to plan and lay out work, handle men and estimate accurately from plans. Address by letter, giving age, experience, reference, &c., "X. Y. Z.," care of John Williams, 556 West Twenty-seventh street, New York City. June 9

TRAVELING SALESMEN or experienced canvassers; please state territory wanted; a large commission to handle the adjustable Twin spring bed; sells nicely as a side line in any part of the United States or Canada. Apply to the Rutherford Mfg. Company, Gouverneur, N. Y. June 9

A competent FURNACEMAN with some capital and business ability to handle and place hot air furnaces in New York and vicinity; manufacturer will give shop room and assistance in securing work; an excellent opportunity for the right man to establish himself in business at a small cost. "Hot Air No. 69," office of *The Metal Worker*, 96-102 Reade street, New York City. June 9

SITUATIONS WANTED.

By a first-class PLUMBER in all branches of the trade; quick and neat worker; country preferred. P. J. Dervin, 159 West Sixty-sixth street, New York City. June 16

In New York City or Brooklyn, by an A1 TIN and SHEET METAL WORKER; thoroughly familiar with range and furnace work in all its details; is employed at present, but would like to make a change; can furnish the best of references. "M. W. P.," office of *The Metal Worker* 96-102 Reade street, New York City. June 16

By a first-class STOVE PATTERN MOLDER; thoroughly posted in all departments of the business; steady position; can give first-class references. "Pattern Molder," office of *The Metal Worker*, 96-102 Reade street, New York City. June 16

By a young man in a tin shop where he can be under instructions; two and a half years' experience; some knowledge of plumbing; good references. "B. A.," Box 260, Mount Morris, N. Y. June 16

By a first-class plumber as FOREMAN; good gas, steam and hot water fitter; steady and reliable; can estimate on work; conversant with the sanitary laws; references. "Plumber," Mount Vernon P. O., N. Y. June 16

By an A1 PLUMBER, GAS, STEAM and HOT WATER FITTER; well posted in estimating and laying out work; willing to work by the day or on commission; best of references; will go to any part of the country. Jones Wilson, Jackson, Mich. June 16

By a TINSMITH accustomed to assortment work; some knowledge of jobbing; position desired in some job or furnace shop; wages moderate; sober and reliable. J. Gibbon, 9 Fremont avenue, Somerville, Mass. June 16

By a first-class PLUMBER; capable of taking charge; also a good general jobber; two years with last employer as foreman; will go anywhere for steady position. J. M. Larkins, 48 Cannon street, Poughkeepsie, N. Y. June 16

By a young man 20 years old, with three years' experience at plumbing and gas fitting; also some knowledge of tin, sheet iron and range work; will go anywhere; wages moderate. F. Martin, 331 North Eleventh street, Philadelphia, Pa. June 16

By a PLUMBER and GAS FITTER; in city or country; wages, $2.75 per day. Albert Durer, 491 Tenth avenue, New York City. June 16

By an all round TINNER; good at country jobbing and furnace work; strictly sober and reliable; steady work desired the year round. "G. E.," Box 487, Bethel, Conn. June 16

By PLATER of 14 years' experience in all branches of plating; have A1 dynamo polishing machines, buffs, &c., suitable for any class of work; will go to any place where steady work can be furnished; contract or salary; best of references. C. H. Smith, 1600 Division street, Burlington, Iowa. June 16

By an A 1 TINSMITH; good milk can maker; inside and outside jobbing tinware; understands all about country work, pumps and creamery work, heater, stove, spouting and roofing; moderate wages; sober, steady and trusty; country preferred; references given. F. M. La Seur, 489 Pearl street, New York City. June 16

By a first-class PLUMBER and GAS FITTER, who understands steam fitting and tin roofing, good jobber. D. McCarthy, 155 Allen street, New York City. June 16

By a strictly moral young man, where he can finish learning the tinner's trade; one years' experience; best of references: have also had experience in clerking; will Milwaukee parties please answer again. "H. K.," P. O. Box 366, Delavan, Wis. June 16

As FOREMAN of a tinware factory by a man with 15 years' experience, who can handle any number of men and understands presses and repairing dies, &c.; can furnish best of references, both as to character and ability. C. F. Bemis, Waucoma, Iowa. June 16

By the year, by a TINSMITH and PLUMBER; competent to do any job; steady; married; good references. Box 193, Newark, N. Y. June 16

By a mechanic, as TRAVELING SALESMAN in connection with the hardware trade; specialist on gasoline and oil gass heating; moderate salary for the first year; New York territory; references. Box 193, Newark, N. Y. June 16

By a PLUMBER; city or country. Thos. J. McDonnell, 238 East Thirty-sixth street, New York City. June 16

Young man; fair education; good salesman; thoroughly acquainted with oil and gasoline stoves; desires position as TRAVELING SALESMAN; good references given. C. F. Hotchkiss, Room 12, Cutler Building, New Haven, Conn. June 16

By a first-class TINSMITH at inside and outside work; general jobber. J. Kleinberger, care S. Herrman, 433 State street, New Haven, Conn. June 16

By an iron PATTERN FITTER, in stove works: 20 years' experience at stove, steel range and hot air heater patterns; have had charge of a pattern shop; sober and steady; good references; married. F. J. Koglin, 99 Wohlers avenue, Buffalo, N. Y. June 16

By young man with 12 years' experience as bookkeeper and sales clerk in retail hardware and stoves; speaks English, Swedish and some German; wages not as much of an object as a steady position. "G. S.," 1056 Milwaukee avenue, Chicago, Ill. June 16

By a STEAM and HOT WATER FITTER; first-class workman; sober. John S. Keefe, 316 W. Thirty-fifth street, New York City. June 16

By a practical TINSMITH, TIN and SHEET IRON WORKER; roofer and general jobber; 18 years' experience; city or country. H. Gold, 92 Essex street, New York City. June 16

By a good all around German-American TINNER, 27 years of age and married; understands the trade in all its branches; can clerk in store when wanted; Chicago or vicinity preferred. "F. S.," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. June 9

To travel in Missouri, Illinois or Indiana, by competent stove, range, hollow ware and tinware SALESMAN; 12 years' experience; temperate; best of references. J. B. Smith, Room 16 Masonic Temple, Indianapolis, Ind. June 9

By a practical and experienced SLATE ROOFER, a situation for the season. B. F. Smith, 30 Rutger street, Springfield, Ohio. June 9

By a thoroughly competent man; all around MECHANIC; 15 years' experience as high and low pressure steam and hot water fitter, also heating with exhaust from engine and hydraulic work; position desired anywhere in the United States; able to take full charge of shop and outside work; best of references. W. K. Farrand, 205 Gates avenue, Brooklyn, N. Y. June 9

In a first-class shop, by a strictly first-class PLUMBER and STEAM FITTER of 24 years' experience; can furnish the highest reference. E. D. Stockton, 204 Crew street, Atlanta, Ga. June 9

By a thoroughly practical TINNER, RETINNER and GALVANIZER of gray cast, malleable, wrought and tin plate stamped ware; tinning gray iron casting with a smooth, silvery, brilliant coating by the grease finishing process; sober and reliable. Wm. Davis, 1911 Broadway, Brooklyn, N. Y. June 9

By a first class STEAM and GAS FITTER of 15 years' experience; would like a job in the South; best references furnished. W. R. Stockton, 204 Crew street, Atlanta, Ga. June 9

By a first-class PLUMBER and GAS FITTER, understanding steam fitting and roofing. Peter Keating, 72 East Tenth street, New York City. June 9

By a practical TIN and SHEET IRON WORKER, single man, who has learned his trade in Germany; three years' experience in this country; steady position desired; city or country; state wages. Louis Krentzman, 345 East Sixty-fifth street, New York City. June 9

By a TINNER with 11 years' experience at his trade; also a first-class man at furnace and hot air work; four years' experience in the tin and hardware business for himself; 26 years of age; married; references; wages moderate; steady work desired. H. S. Andrus, 19 West Arch street, Shamokin, Pa. June 9

By a PLUMBER and GAS FITTER; good at steam fitting, tin roofing, new work or jobbing. Benj. Grimes, 46 Clinton Place, New York City. June 9

As TINSMITH; can do job plumbing and wait on store; best of references as to character and ability. "H. J. D.," 186 Ohio avenue, Providence, R. I. June 9

As TRAVELING SALESMAN for a stove foundry in Eastern Pennsylvania, by a young married man, 32 years of age; understands bookkeeping; ten years' experience with present employers. "Salesman," office of *The Metal Worker*, 220 South Fourth street, Philadelphia, Pa. June 9

By a TIN and SHEET IRON WORKER; 12 years' experience; understands all outside work, gutters, roofing, furnace, stove, range and fire place heater work and general jobbing; city or country. L. Saltman, 223 Fairmount avenue, Philadelphia, Pa. June 9

A position as TRAVELING SALESMAN; eight years' experience in general hardware as such; 29 years of age and single. "N. C.," 89 Pierpont street, Brooklyn, N. Y. June 9

By competent energetic man, as SALESMAN for stoves, ranges, furnaces or machinery in New York City, Brooklyn and Northern New Jersey; capable of figuring on contracts, directing work, &c.; moderate salary. "Salesman" No. 69, office of *The Metal Worker*, 96-102 Reade street, New York City. June 9

By a first-class PLUMBER; city or country. Chas. Baumbach, 419 West Thirty-sixth street, New York City. June 9

As TINNER or CLERK in hardware store; ten years' experience in store and shop; good workman on inside and outside work, also good salesman; strictly sober. Call Box 524, Louisiana, Mo. June 9

By July 1 by thoroughly experienced GALVANIZER and TINNER; competent to put in works; reference given. "R. C. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. June 9

By a first-class PLUMBER; city or country. James Donahue, 241 East Seventy-sixth street, New York City. June 9

By a first-class TINSMITH, ROOFER and GENERAL JOBBER; best of references. John Klein, 616 Fulton street, Elizabeth, N. J. June 9

An A1 MACHINIST, 26 years of age, expert on lathe, desires a permanent position; German; married. Chas. Bertranz, Carlstadt, N. J. June 9

By a young man who has a thorough practical knowledge of furnace and range business. H. A. Landrau, 321 East Eighty-fifth street, New York City.

A1 TRAVELER seeks road engagement to introduce and put on the market specialties in the tin, copper, stove, range or furnace line; well acquainted on the road from Maine to Nebraska; have worked the trade for the past 15 years with A1 result; open for engagement at present. "J. P. B.," 26 John street, Lockport, N. Y. June 9

By a man of experience in manufacturing stoves, specially effective in managing sales, accounting, correspondence and furnace heating; particulars and ample reference furnished; no capital except push and common sense. "S. E. W.," office of *The Metal Worker*, 96-102 Reade street, New York City. June 9

At PLUMBING, STEAM and HOT WATER FITTING; understands working on tinware, the work generally done in a country shop; seven years' experience; 23 years of age; strictly temperate and steady, "S.," Box 82, Lakeport, N. H. June 9

As SUPERINTENDENT or FOREMAN and CUTTER in cornice and sheet metal work, by a man 40 years of age; always sober and industrious; experience of 20 years in the cornice business estimating and cutting. "Mac," office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. June 9

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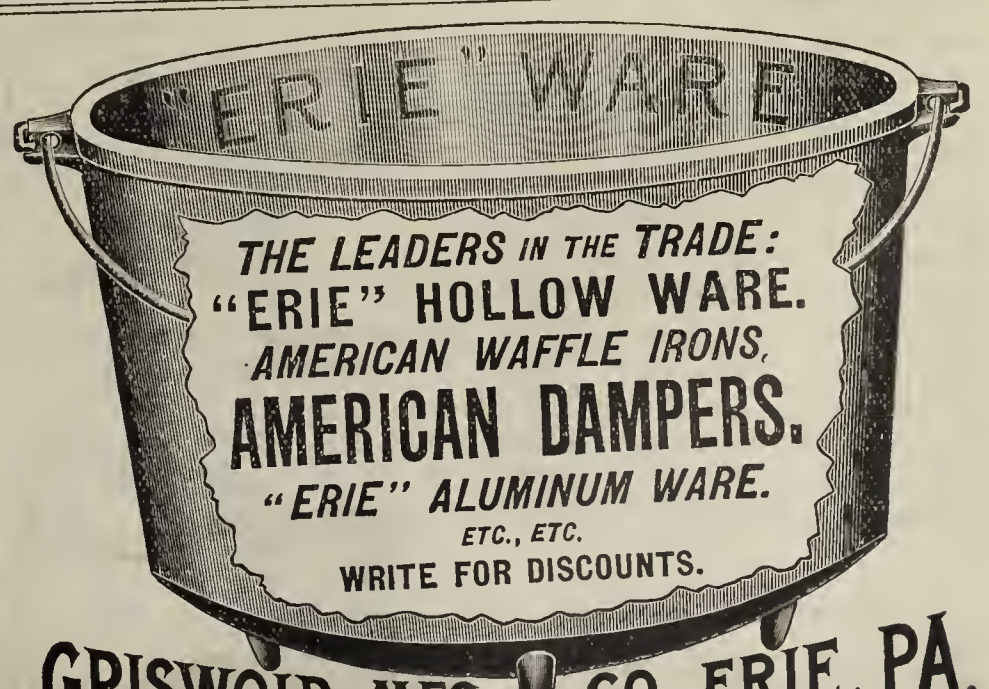
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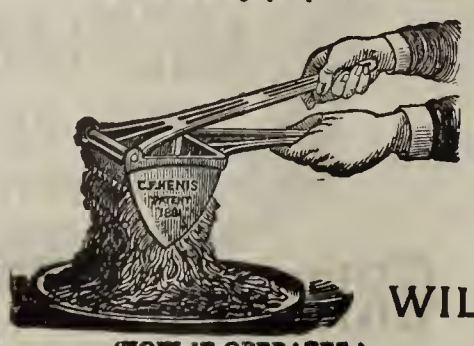
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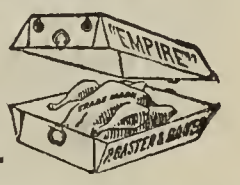
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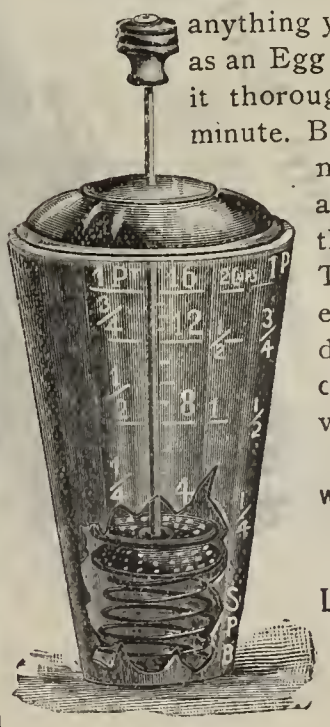
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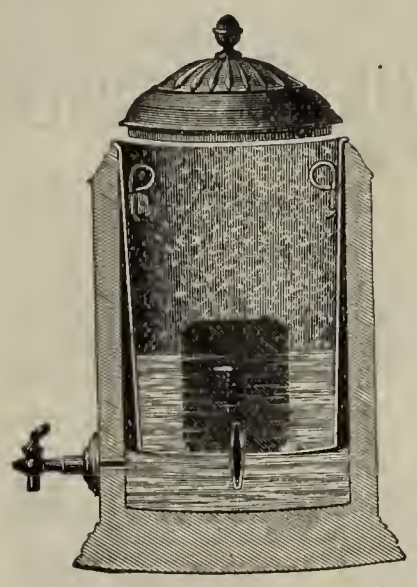
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GALLONS—	2	3	4	6	8	10	14
Japanned or Crystal, each,	$4.50	5.00	5.75	7.00	8.50	10.50	14.50
Extra Heavy—Japanned, with side handles, each,	$6.00	6.50	7.50	8.75	9.75	12.00	16.50

Filter Cylinders Only, Fitted with Carbons.

GALLONS—	2	3	4	6	8	10	14
Each,	$2.50	2.75	3.00	3.50	4.00	4.50	5.50



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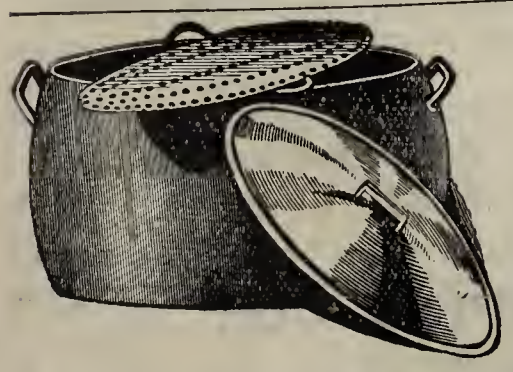
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Early Use of Lead.

Some of the ancient domes at Ephesus, says an English exchange, were sheathed with lead, and it appears that the column of Constantine at Constantinople was formerly covered with the metal. It is certain that lead mines were worked in Britain by the Romans, and long before the conquest plates of lead were used as coverings for ecclesiastical buildings. These coverings being designed to endure were of very thick lead. In 1231 water was brought from Tyburn to London in pipes, but the material of the pipes has not been ascertained. In 1285 the great conduit in Cheapside was supplied with water conveyed through pipes from Paddington; these pipes are expressly stated to have been of lead. It has, however, been averred that lead pipes for conveying water were first introduced by Robert Brook in the reign of Henry VIII. Sheet lead was used in Spain and Portugal for sheathing ships and for covering the rudders long before it was employed in England. It was used in Holland in 1666 and at Venice in 1710. It is probable that we are indebted to Sebastian Cabot for its introduction into England. It is stated in his memoirs that he first saw it used in 1514; he was then in the service of the King of Spain, which he entered in 1512, and was appointed Pilot-Major; he afterwards returned to England and in 1553 was named by Queen Mary "Governor of the Mysterie and Company of Merchant Adventurers for the Discovery of Regions, Dominions, Islands and Places Unknown." Three vessels were fitted out for this purpose under the command of Sir Hugh Willoughby, one of which was sheathed, or at least partly so, with thin plates of lead, then first mentioned as an "ingenious invention." In the reign of Elizabeth a patent was granted to one Humphrey for melting lead, but was afterwards recalled, the plan not being new. It appears that up to about 1670 cast sheet lead was used for sheathing; at that time milled lead was invented and a patent for milling lead was granted to Sir Philip Howard and Francis Watson. By this process the inequalities as well as the defects from air holes in the former mode of manufacture were remedied; the whole surface was rendered smooth and uniform and the weight greatly reduced. This invention met with much opposition from the plumbers, who averred that it could not be durable; an offer was therefore made on the part of the Milled Lead Company to keep in repair during 41 years all milled lead of the weight of 7 pounds per square foot at the rate of 5 shillings annually per each £100 worth in value.

A novel process of soldering glass and porcelain with metals is mentioned by an English exchange as having been invented in France, and its adaptations seem likely to be as numerous as they are valuable. After the process the glass tube, covered with copper, can, it is stated, be treated like a genuine metallic tube and soldered to iron, copper, bronze, platinum, or any other metals that can be united with tin solder.

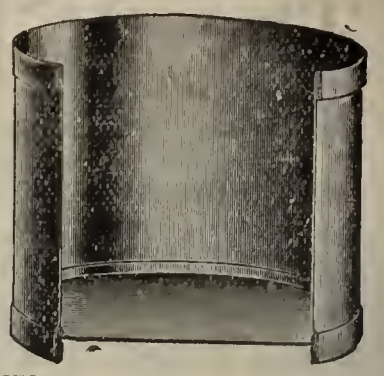
— TWO SUITS.—"Did you go to Binns, the tailor?"

"Yes, got two suits from him. One dress suit. One law suit. Very expensive man."—*Boston Home Journal.*

— SERGEANT: "What have you run this man in for? Did you find anything crooked about him?"

Officer McGobb: "I did, sor; it was a corkscrew."—*Indianapolis Journal.*





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WROUGHT STEEL GRAIN MEASURES.

STANDARD.

Capacity, ¼ peck, ½ peck, 1 peck, 2 pecks.

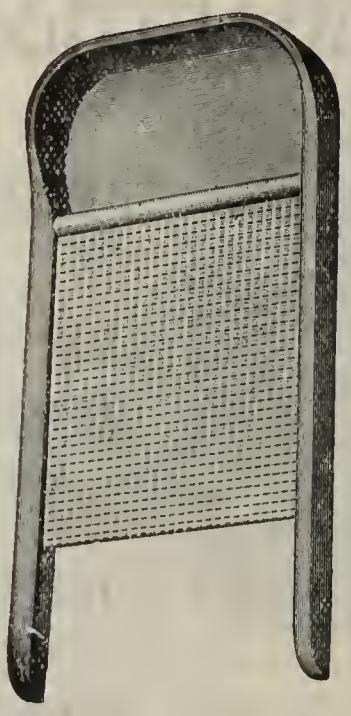
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This measure is without doubt the best article of the kind on the market. The bottom is fastened mechanically in the slot formed by the peculiar method of folding the bottom, which is clearly shown in the cut above. It is further strengthened by the band folded at the top.

It is made completely of solid steel and is warranted to outlast any other measure. Manufactured only by

The Bellaire Stamping Co., Harvey, Ill.

The Utility Washboard



Is a Zinc Board made from best quality No. 6 Zinc, the heaviest and strongest Zinc in use for Washboards.

CRIMP—The Crimp is our Improved Deep Globe acknowledged far superior to any now in use on other boards.

OFFERS—absolute protection from water at sides as well as the top of the soap board.

WHY?—Because being made of one piece which is bent thin and broad at the sides and top of soap board where all splashing occurs, it is impossible in washing to splash over it.

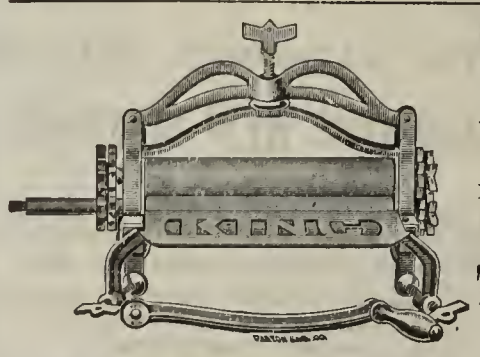
CONSTRUCTION—The Board in point of construction excels anything of its kind ever produced. Its lines present a symmetry and regularity pleasing to the eye, and in point of strength is unquestionably superior to any.

SALES—Where these are offered for sale competing boards are not "in it."

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Fort Wayne, Ind., U. S. A.



We are Sole Manufacturers of the Celebrated Erie and King Wringers.

We also make all other brands of Wood and Iron Frame Wringers.

Exclusive sale of the **ERIE** and **KING** Wringers given to one dealer in each town.

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The National Wringer Co., CANTON, OHIO.

New York Office, 107 Chambers St., John T. Ryan, Mgr.

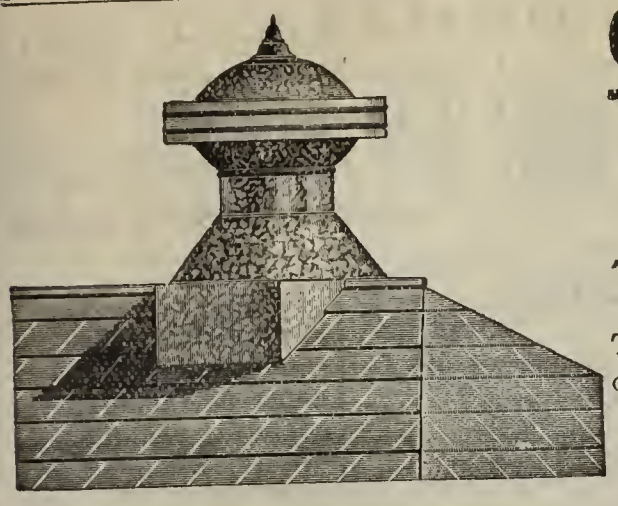
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May be a slang expression, but it doesn't apply to

Globe Ventilators.

They "get there" and "stay there"

Through sunshine and through storm, doing the work required of them silently, steadily, satisfactorily.

Send for Special Pamphlet on Ventilation.

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A Snap

MOLDER

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A. G. BRAUER.

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THERE RUTLAND LINING WHY

IS CARRIED BY THE BEST TRADE IN

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IT FITS ANY STOVE AND IS CHEAP.

RUTLAND FIRE CLAY CO., Rutland, Vt.

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TARBOX

For your Stoves. All Dealers

"FIRESTONE."

A new material which makes the strongest, most refractory and Non-Clinker Lining for Stoves, Ranges and Furnaces.

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NATIONAL Return Facing and **BRILLIANT** Heavy Stove Plate Facing are as necessary as bread and meat to the molders, in order to make

BRIGHT, SMOOTH CASTINGS.

Manufactured only by **THE S. OBERMAYER CO.**, Factories, { Cincinnati, O. / Chicago, Ill

Manufacturers Foundry Facings, Supplies and Equipments. General Catalogue Sent on Application.

MANUFACTURERS
BELLOWS, 8, 9, 10 & 12 in.
SIEVES, IRON, BRASS, &c.
BRISTLE BRUSHES.
WIRE BRUSHES, &c.
SAND-SIFTING MACHINES.
CUPOLAS, LADLES, &c.

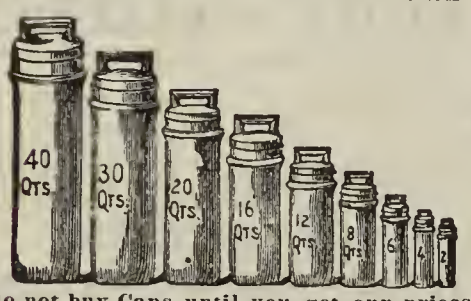
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The frequency of the question—"Why can't we get two shipments alike?"—gives us an opportunity to affirm as to the reliability of our FACINGS. Our many customers and increasing trade warrant us in making this assertion, and a trial order will convince you that "WE ARE IN IT."

MANUFACTURERS
RETURN FACINGS.
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CLAD'S
Iron Enameled Ice Cream Cans



Do not buy Cans until you get our prices. We are Headquarters.

CLAD'S
Ice Cream Dishers and Measures.



Millions in use. Seamless cups, will not rust. German Silver knives; and not tin knives. Cream will not stick to sides. Sizes standard.



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THE TRIUMPH COOKER,
WITH LOCK COVER.



STEAMLESS, ODORLESS AND NON BOIL-OVER.
THE MOST COMPLETE COOKING UTENSIL EVER OFFERED TO THE PUBLIC.
A GREAT SELLER. Retailers are invited to send for prices. Jobber' discount allowed to first-class dealers.

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— Bridegroom (at the end of the wedding): "Well, I am glad it is all over!"

Married Friend: "All over? Great Scott, man! You have only just commenced."—*Puck.*

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MANUFACTURERS OF

Stove, Range & Heater Repairs

AND FIRE-BRICK LININGS,

Agents of **THE GLOBE VENTILATOR CO.,**

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Nickel, Brass and Copper Plating, Brass and Iron Turning and Finishing.

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Stove Trimmings, Knobs, Hinge Pins, &c. ☞ Estimates given on application for the manufacture of Novelties and Ornamental Metal Goods. ☜

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A sample of Dixon's Pure Flake Lubricating Graphite is sent free of charge with an interesting and instructive pamphlet. Every wide-awake engineer and mechanic should send for them.

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IF SO,

You want our SQUEEZER.

Positively the best. Suitable for any size lemon.

We also make the finest

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in the country. Beautiful designs; all sizes; large stock.

Write for Samples, Catalogue and Prices.

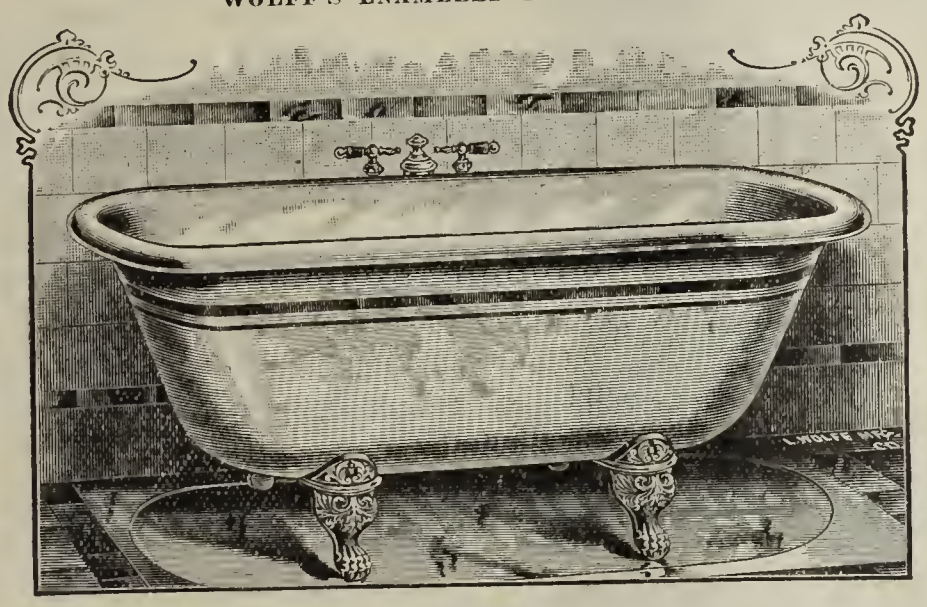
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L. WOLFF MFG. CO.,

PLUMBING GOODS.

GENERAL OFFICES, 93 West Lake Street, Chicago.

WOLFF'S ENAMELED IRON BATHS.



B–63.

Samples of our make Enameled Goods may be seen at our

SHOW ROOMS: 91 Dearborn St., CHICAGO; 1533 Blake St., DENVER, COLO.; 11 N. Washington Ave, MINNEAPOLIS, MINN.

WRITE FOR SUPPLEMENT NO. 1 (WOLFF'S ENAMELED BATHS.)

DO YOU WANT TO TAKE A QUICK BATH?

BUY ONE OF THE

ECONOMY PORTABLE BATHTUBS



ON CASTERS WELL PAINTED WEIGHT: 24 Lbs. WITH PLUG & LEG ATTACHMENT FOR EMPTYING

5 FT. 5" LONG 2 FT. WIDE ROUND BOTTOM IT IS MADE OF THE BEST ZINC WITH RIM OF WELL SEASONED BENT HARD WOOD ENAMELED IN SIDE.

IT SURPASSES ALL OTHERS IN SMALL AMOUNT OF WATER REQUIRED, NEATNESS OF DESIGN, SPACE OCCUPIED.

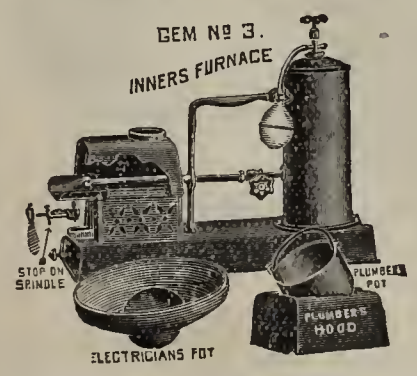
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FOREST DRUKENBROD NEW BERLIN, OHIO.

The GEM GASOLINE

Soldering Furnaces.





Please Recollect

IF OUR GEM No. 3 and 6 cannot be worked out of doors or on roofs in all kinds of weather, that you can bring them back and your money will be returned. CAN YOU ASK MORE?

All have cylindered cast iron burner so arranged that solder cannot clog them.

Ask your Jobbers for them or Write for Prices.

Manufactured by **Burgess Soldering Furnace Co.,** COLUMBUS, OHIO.

Buy Iwan's Volcano Revolving & Ventilating Chimney Top



The best in the World

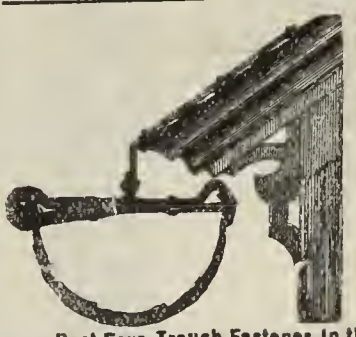
For simplicity, durability and practicability, WE DEFY COMPETITION. It is unexcelled in producing a regular draft at all times. Send for prices and samples before purchasing some inferior article.

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Best Eave Trough Fastener in the World.

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Successors to CHAS. BODY,
269 to 275 Central Ave., Cleveland, Ohio.
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A COMPREHENSIVE TREATISE ON

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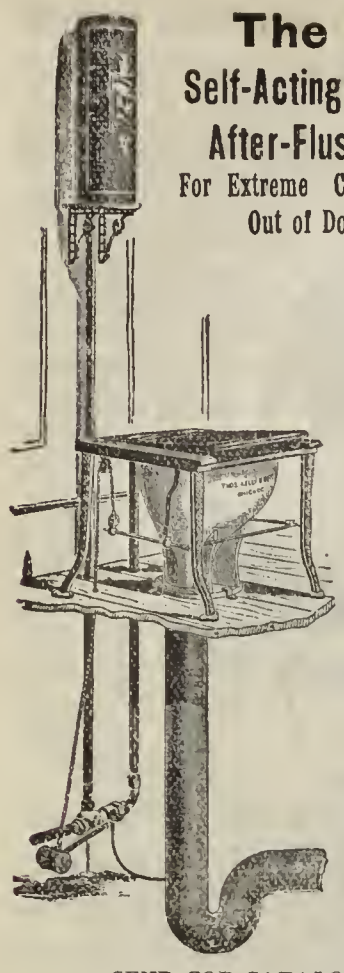
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For Extreme Cold Places and Out of Door Work.

When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

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DAY'S INSTANTANEOUS HEATER AND BATHTUB COMBINED.

The only Portable Folding Bathtub made; can be stored in space 2½ x 2½ x 6 feet; can be moved from bathroom to sickroom.

Write for catalogue and discounts

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Gas-Lighting and Gas-Fitting

—INCLUDING—

Specifications and Rules for Gas Piping, Notes on the Advantages of Gas for Cooking and Heating, and Useful Hints to Gas Consumers.

By WM. PAUL GERHARD.

A pocket-book for gas companies, gas engineers and gas fitters, for manufacturers of gas fixtures and dealers in gas appliances, for gas consumers, architects and builders, health officers and sanitary inspectors.

Second Edition, Rewritten and Enlarged.

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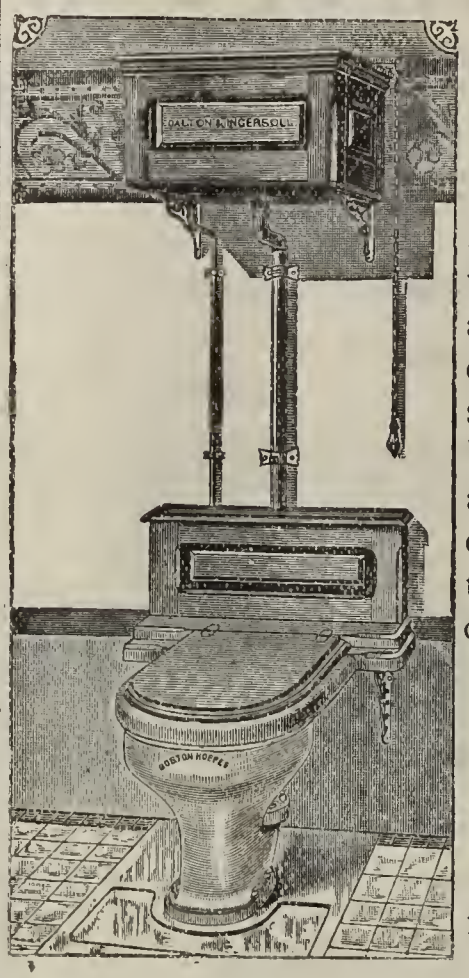
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(TRADE-MARK.)



Considered the perfection of closets. It is a modification of what is known to the trade as a Short Hopper and Trap combined. Its exterior outline is in pedestal form, which gives perfect support to the bowl. This construction will allow the seat to rest directly on the closet, dispensing with the use of seat legs, if so desired, allowing a better opportunity for cleaning around the closet. This feature of construction will recommend itself to those looking for simplicity and cleanliness.

[See our advertisement next week for sectional view.]

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Wholesale Dealers in Plumbers' Supplies,

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THE STEEL CLAD BATH

is an indestructible, graceful steel shell lined with heavy tinned and planished copper. It cannot warp, rust, or collect dirt, and is an open sanitary fixture at a moderate cost. Enameling and decorations to match the bathroom.

FOR SALE BY ALL JOBBERS.

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USE "OUR OWN" BASIN PLUGS.



No other lettering on them.

SAMPLE DOZEN ASSORTED $1.

HANDSOMELY NICKELED. BEST QUALITY STOCK.

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MANUFACTURER OF

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Urinal Stalls, Laundry Tubs, Sinks, Closet Slabs, Basin Slabs, Floor Slate, Building Slate.

Slate in all Forms also Slate Mantels.

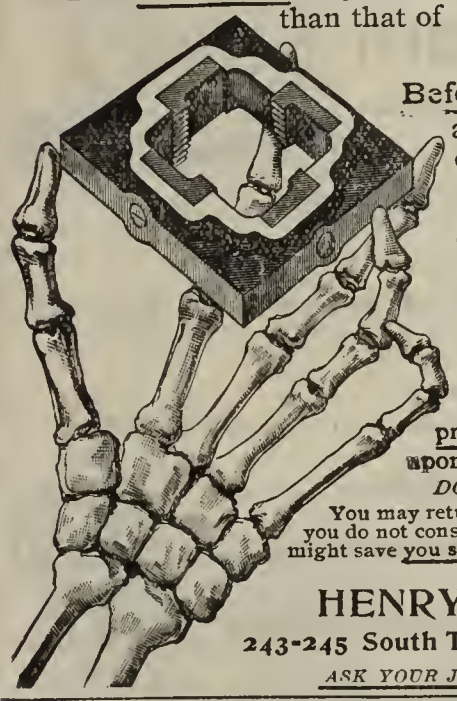
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Maule's "Skeleton" Pipe Die

Two "Points" about it—only 2 (There are plenty more, but we only mention these two here.)

1

The First Cost to you of MAULE'S "SKELETON" PIPE DIE is less than that of any other Pipe-Threading Die—and



2

Before it becomes dull from use it will cut as many perfect threads as the best solid die extant, and when it is dull, you don't throw it away and buy a new one—Oh, no! You simply sharpen the cutters on a common grindstone, and so make it practically as good as it was at first, and this sharpening process may be repeated a number of times.

A sample **One-inch "Skeleton" Pipe Die,** either 2⅜ or 2½ x ¾ thick, by mail, postage prepaid, will cost you **62 cents,** and will be sent upon receipt of a Postal note for that amount.

DO NOT SEND US ANY POSTAGE STAMPS.

You may return such sample to us, at our expense, if, after seeing it, you do not consider it worth the price. Don't the above sound as if it might save you some money—if TRUE?

HENRY B. PANCOAST & CO.,

243-245 South Third St., Philadelphia, U. S. A.

ASK YOUR JOBBER WHAT HE KNOWS ABOUT THIS TOOL.



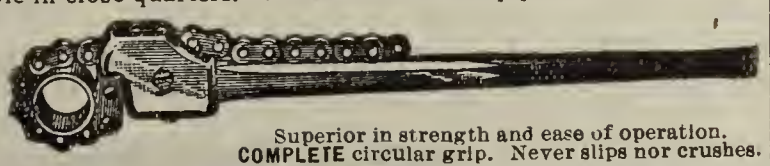
TRIMO PIPE WRENCH,

Forged Steel.

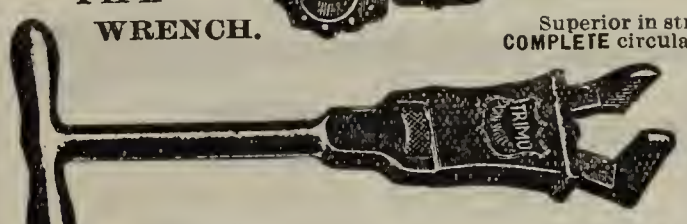
All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

TRIMO CHAIN PIPE WRENCH.



Superior in strength and ease of operation. COMPLETE circular grip. Never slips nor crushes.



Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.

TRIMO BASIN WRENCH.

TRIMONT MFG. CO., ROXBURY MASS

PECK BROS. & CO.,

Fine Sanitary Goods.

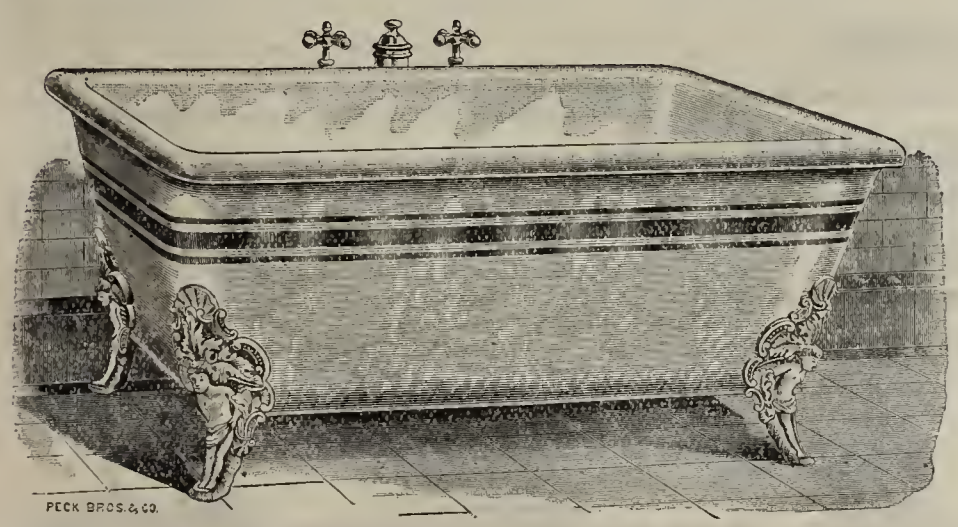


Fig 198, Catalogue of 1893.

47 Cliff St, NEW YORK. 259 Wabash Ave., CHICAGO. 127 Chestnut St., NEW HAVEN, CT. 65 Oliver St., BOSTON.



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PATENT

SELF CLOSING

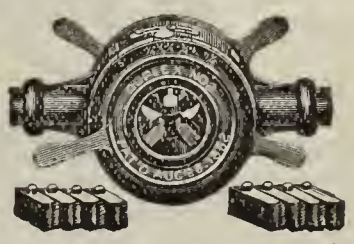
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EVERY ONE WARRANTED

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SOLE MANUFACTURERS.



DUPLEX

DIE STOCK.

COSTS MORE BUT!

Lasts a lifetime and doesn't require strength of a giant TO WORK IT

THE HART MFG. CO., · · CLEVELAND, O.

LEATHER AND RUBBER

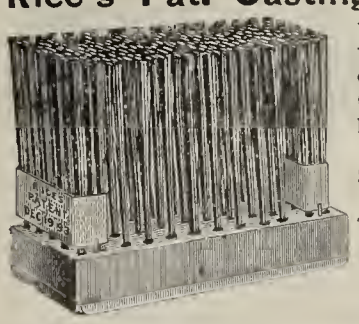
WASHERS,

Machine cut, at less price than can be cut by hand. Send sample for prices.

I. G. MARSTON & CO.,

200 Ruggles St., Boston, Mass.

Rice s Pat. Casting Brush



will outwear three of any other kind. Our prices the lowest.

Send for Circular.

THE RICE MFG. CO. New Durham, N. H.

— MARIE: "Charlie Debrie is an easy going fellow, don't you think?" Claire: "Well, no. He comes to see me about one evening a week and I have found him quite different."



The Climax Gas Machine and Gas Mixer produces a steady, brilliant, highly satisfactory gas, **free from smoke, which burns through plain non-regulating burners.** It is a modern, perfected apparatus warranted satisfactory and guaranteed unsurpassed in any particular. For completeness, convenience and simplicity it has no equal. Sells to good trade who want the best and most desirable and will not submit to the objections of the old time machine, viz.: smoke and adjustable burners. Send for catalogue.

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THE CENTENNIAL WATER CUT-OFF

FOR CISTERNS.

It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

For sale by the trade.

Ask your jobber for them

COONEY, SEINER & CO,

Successors to

MYER & COONEY,

Manufacturers,
19 & 21 E. South St.,
INDIANAPOLIS, IND.

3-inch sample, by mail 40 cts. in stamps.
4-inch do., 60 cts.



The following houses are special agents who will furnish this Cut-off at manufacturers' prices:

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Lead Pipe, Sheet Lead, Shot,

Plumbers', Steam and Gas Fitters' Supplies of all kinds. Also Manufacturers

IMPROVED SANITARY WATER CLOSETS.

Wrough Iron Pipe of all sizes cut to order



Principles and Practice of Plumbing.

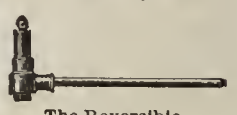
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The Curtis Pipe Vise.



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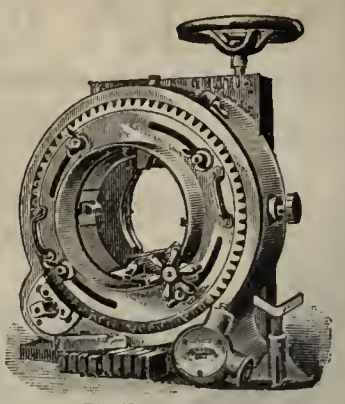
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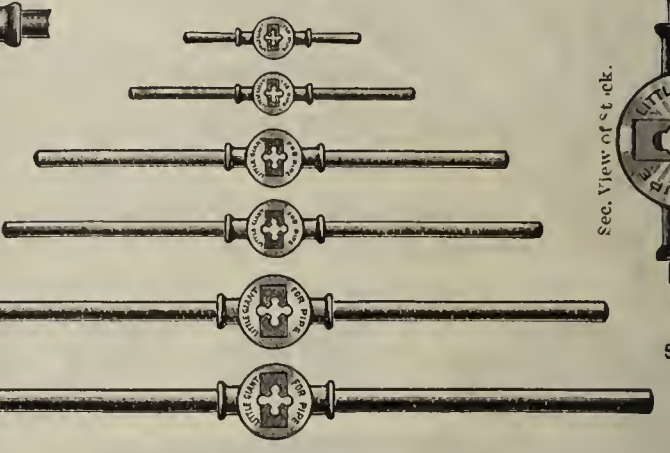


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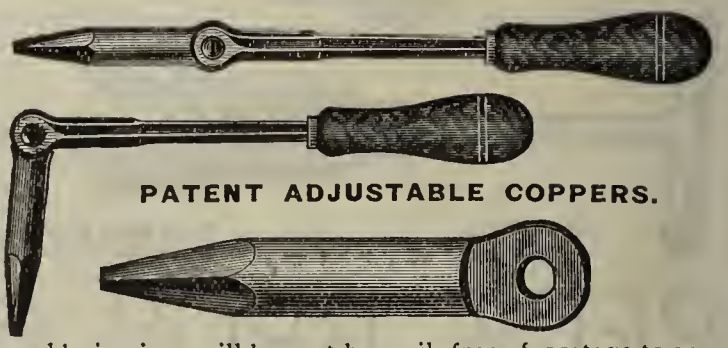
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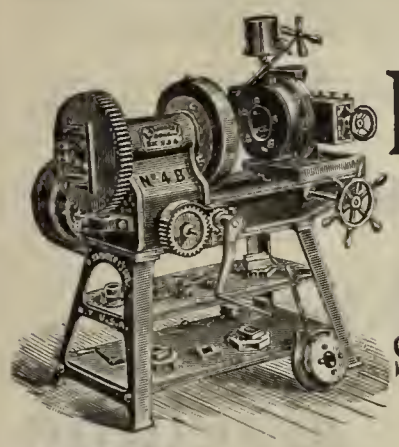
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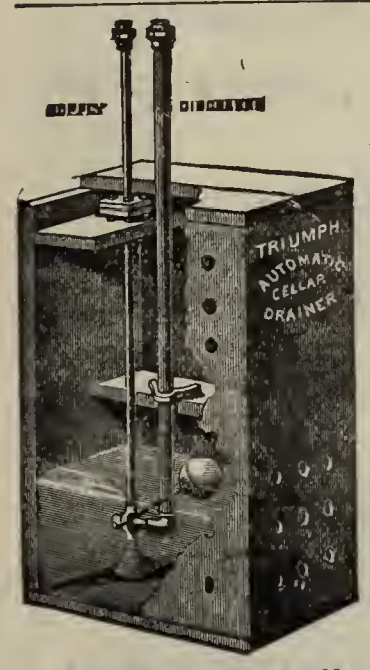
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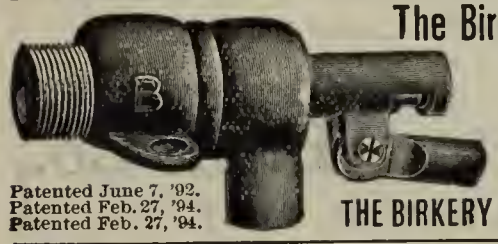
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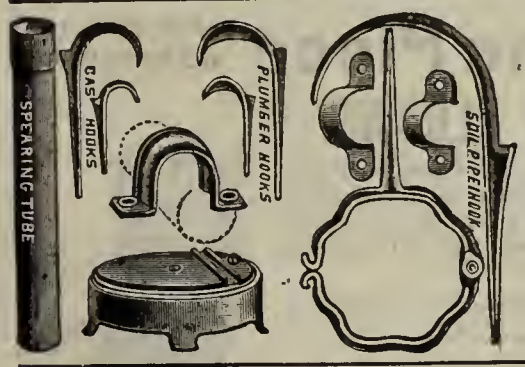
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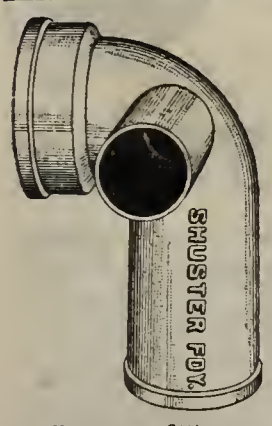
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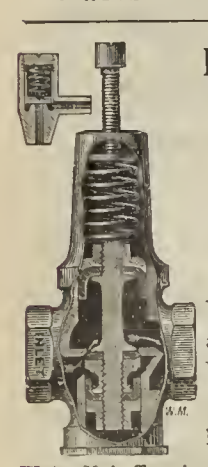
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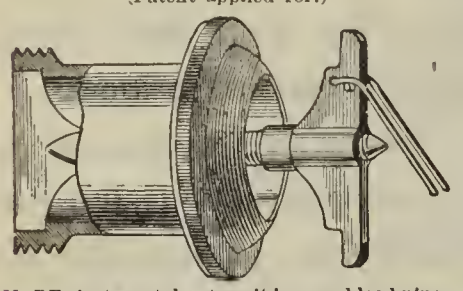
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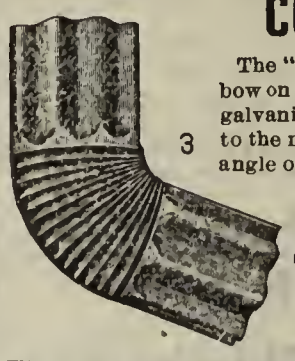
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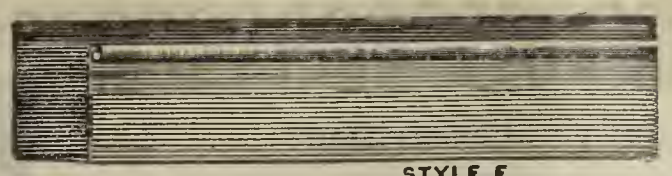
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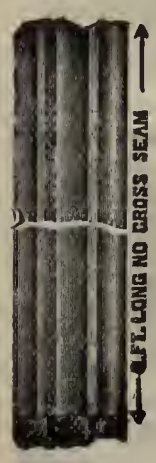


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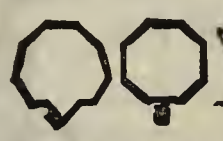
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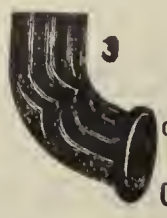
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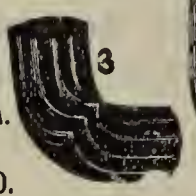
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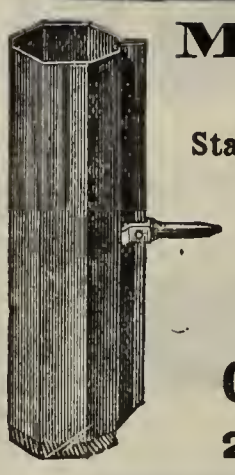
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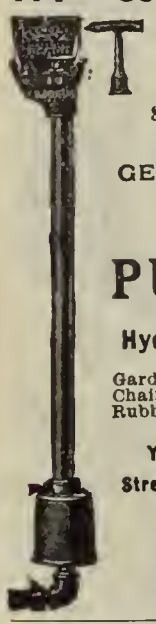
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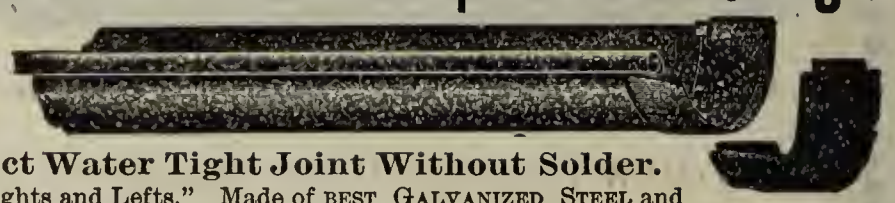
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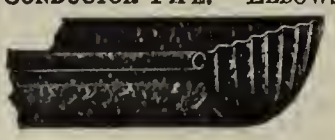
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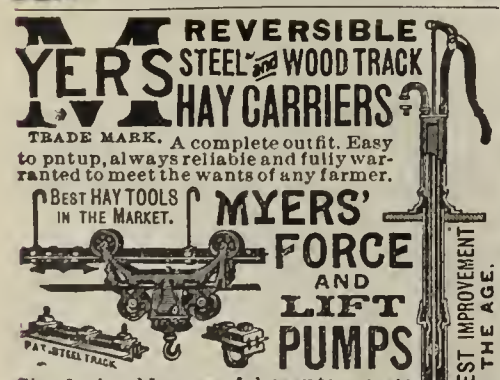
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ABSTRACT OF CONTENTS.

Rules for Describing Patterns; Practical Geometry; Mensuration of Surfaces; Mensuration of Solids, and Capacities of Bodies; Tables of Weights, &c.; Tables of the Circumference of Circles and of the Areas of Circles; Rules for Rendering the Tables Useful; Sizes of Tinware; Capacity of Cylinders, and various other Useful Tables and Information; Practical Receipts Varnishes, Lacquers, Cements, Metallic Alloys, Miscellaneous Receipts; Strength of Materials, with Tables Index.

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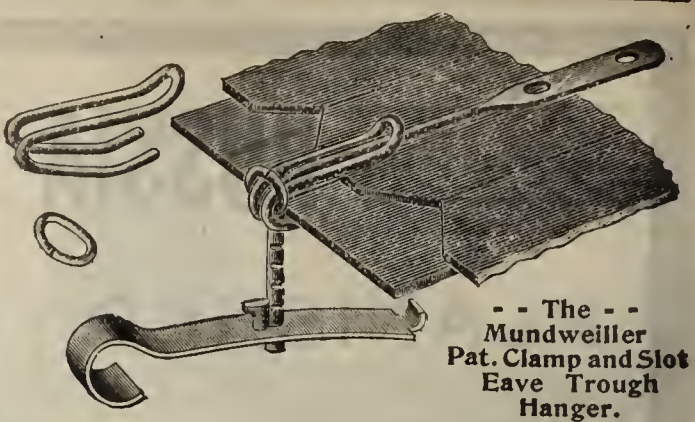
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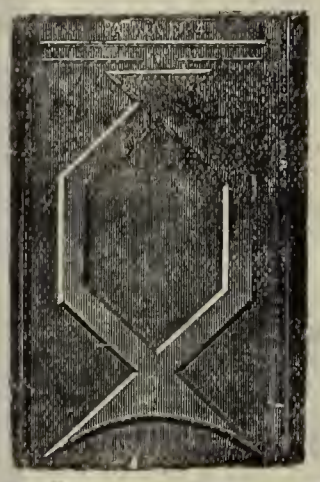
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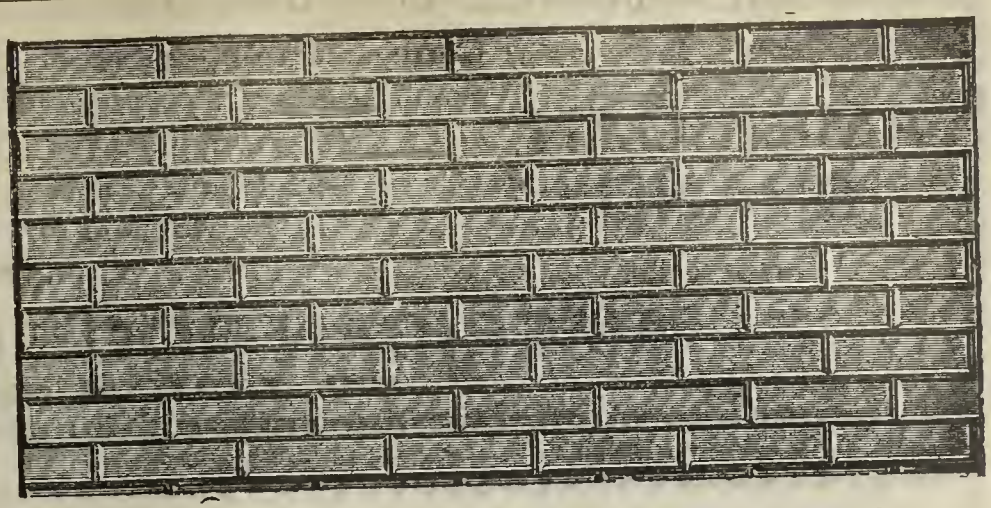
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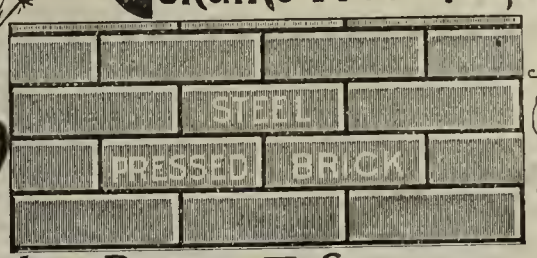
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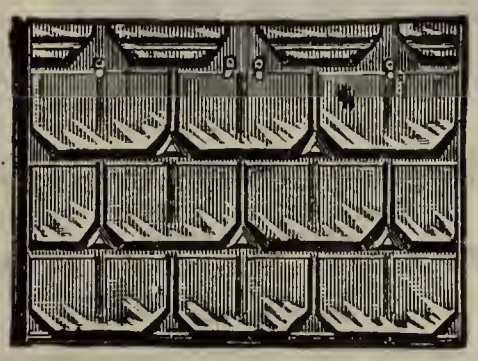
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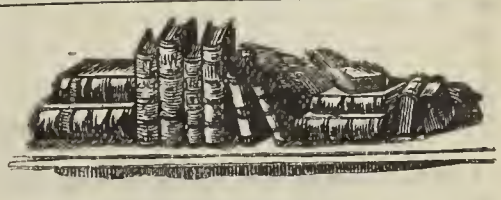
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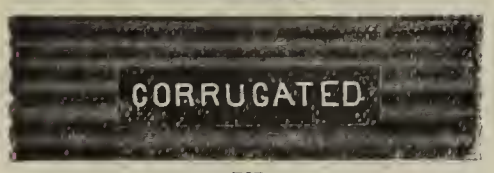


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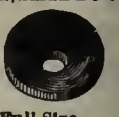


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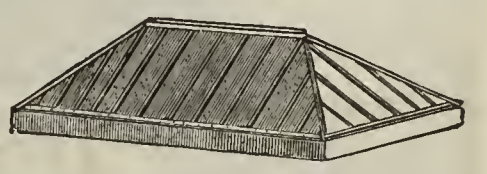
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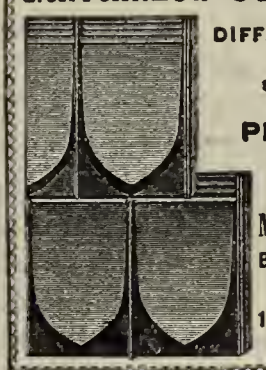
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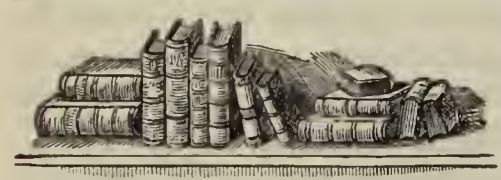
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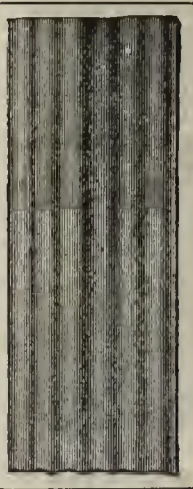
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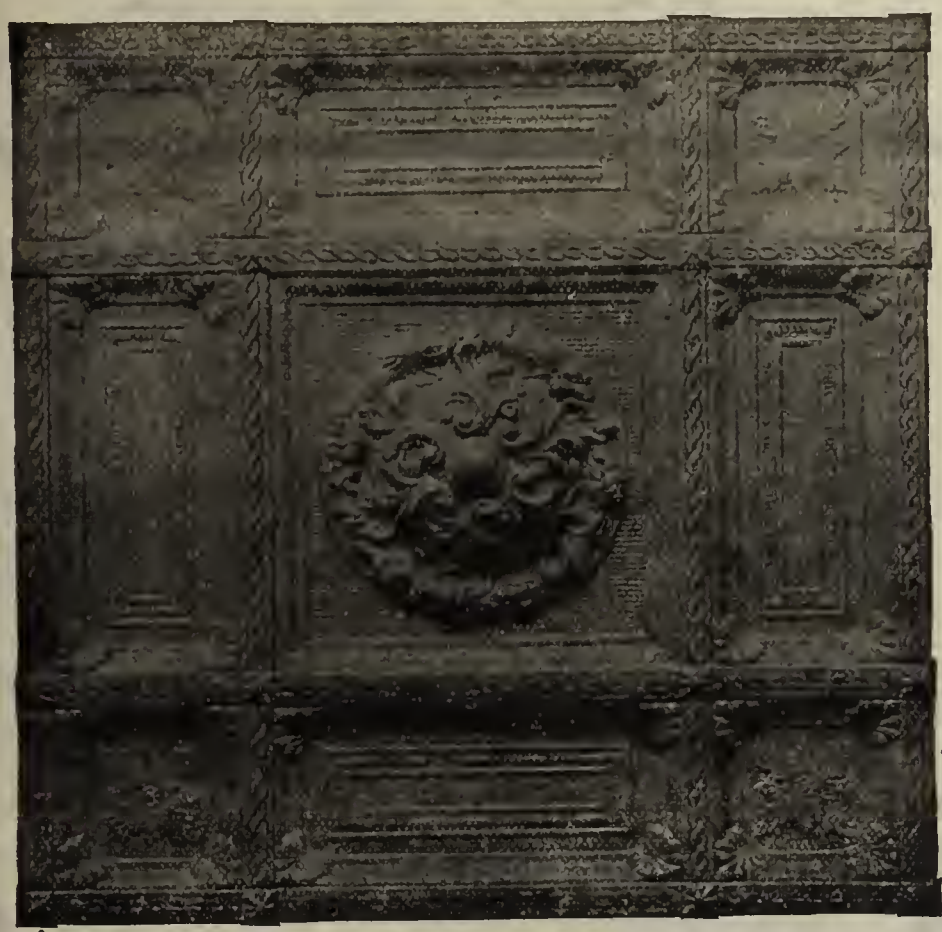


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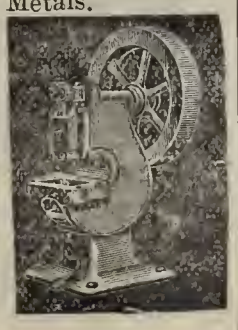
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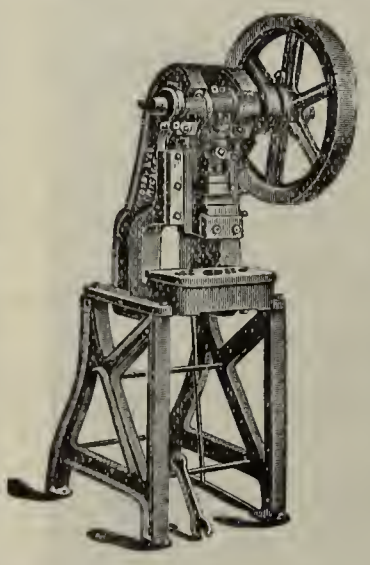
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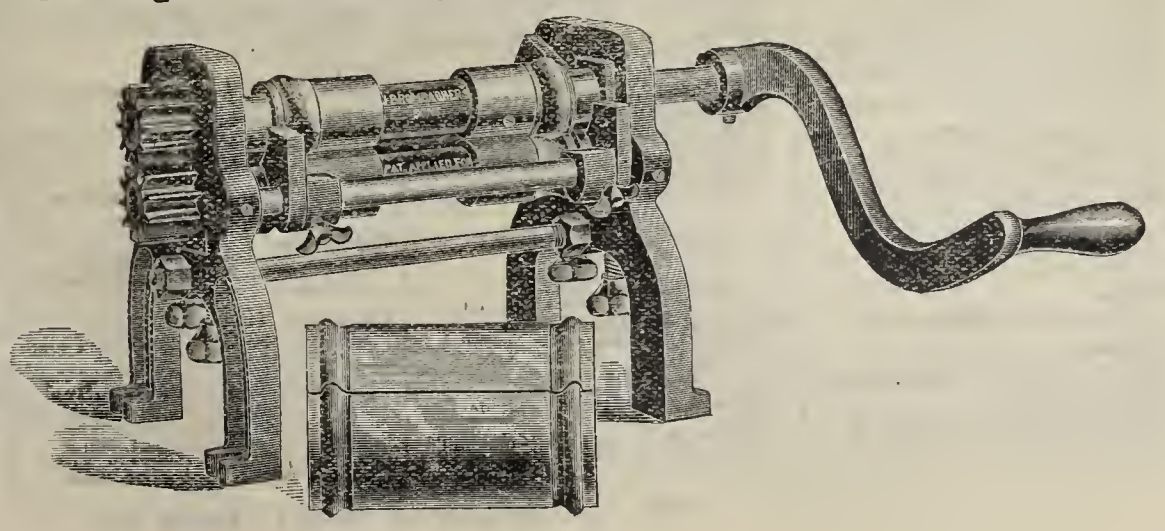
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Handles and Knobs.
Specialty Wood Working Co., Warren, Ohio.

Hardware Specialties.
Philadelphia Hardware & Malleable Iron Works, Philadelphia, Pa.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heaters, Steam and Hot-Water.
Barstow Stove Co., Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Fuller & Warren Co., Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
McLain, J. H. Co., New York.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Putnam Foundry & Machine Co., Putnam Conn.
Raymond & Campbell Mfg. Co., Middletown, Pa.
Richmond Stove Co., Norwich, Conn.
Scollay, Jno. A., Brooklyn, N. Y.
Smith Co., H. B. 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass
Springfield Coil Boiler Co., Springfield, Mass.
Weathered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
Iron Clad Mfg. Co., 22-24 Cliff St., N. Y.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.
Stuart & Peterson Co., Philadelphia Pa.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.

Ice Cream Measures.
Clad, Valentine & Sons, Phila., Pa.

Iron, Galvanized Sheet.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry & Clark, 535-547 West 15th St., New York.
Moorhead-McCleane Co., Pittsburgh, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Kalameined.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphi Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Moorhead-McCleane Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co, St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
U. S. Iron & Tin Plate Mfg. Co., Demmler, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee. Wis.

Iron & Wire Work, Ornamental.
Barnum, E. T., Detroit, Mich.

Lamp Stoves and Heaters.
Glazier Stove Co., Chelsea, Mich.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Manufacturers' Agents.
Rankin & Co., London, England.

Metal Ceilings.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.

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Metal Stamping and Spinning.
Lupton's, David Sons, Philadelphia, Pa

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Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.
Schoonmaker, A. O., 158 William St., New York.

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Mica Mfg. Co., 89 Fulton St., N. Y.

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Obermayer, S. Co., Cincinnati, Ohio.
Smith, J. D., Foundry Supply Co., Cincinnati, Ohio.

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Bolgiano Mfg. Co., Baltimore, Md.

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N. Y. Nickel Plating and Mfg. Co., 227 and 229 West 29th St., N. Y.

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Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

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Covert Mfg. Co., W. Troy, N. Y.

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Gobeille Pattern Co., Cleveland, Ohio.
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Dalton-Ingersoll Co., Boston, Mass.
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Peck Bros. & Co., New Haven, Conn.
Savill, Walls & Co., Phila., Pa.
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Deming Co., Salem, O.
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American Roofing Co., Cincinnati, O.
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Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
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Columbia Roofing Co., Canton, O.
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Bangor Excelsior Slate Co., Bangor, Pa.
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Johnson, E. J. & Co., 38 Park Row, N. Y

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Bolgiano Mfg. Co., Baltimore, Md,

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Brombacher's Sons, Jacob, 30 Cliff N. Y.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover, Del.

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Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co.. Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stark Machine & Tool Co., Buffalo N. Y.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co. Toledo, O
Tuerk Water Meter Co., Fulton, N. Y.

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Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Sanderson & Peckham, Detroit, Mich.
Van Noorden, E. & Co., Boston, Mass.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

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Miller, J. A., & Bro., Chicago, Ill.

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Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y,
Salem Nail Co., 292 Pearl St., N. Y.

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Solder.

Bruce & Cook, 186 to 190 Water St.. N. Y
Gummey, Spering & Co., Philadelphia. Pa.
Lang, E. M. & Co., Portland, Me.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N & G. Co., Philadelphia, P

Soldering Irons.

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Nason Mfg. Co., 71 Beekman St., N. Y.
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Stove and Metal Polish.

Dixon, Jos. Crucible Co., Jersey City N. J.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

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Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.

Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cincinnati Pattern Wks., Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Goblelle, W. M., Cleveland, Ohio.
Goblelle Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Ruth, Patterson & Rnth, Alliance, O.

Stove Pipe Thimbles.

Bretch, A., Dayton, O.
Cheney, S. & Son., Manlius, N. Y.
Stearns, E. C. & Co., Syracuse, N. Y.

Stove Repairs.

Braner, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.

Greene, W. F., Troy, N. Y.
N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., City.
Troy Nickel Works, Troy, N. Y.

Stoves and Ranges.

Chicago & Erie Stove Co., Erie, Pa.
Dippo Mfg. Co., Chagrin Falls, Ohio.
Eclipse Stove Co., Mansfield, Ohio.
Excelsior Mfg. Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N. Y.
Graff & Co., 208 Water St., N. Y.
Kahn, F. & L. & Bros., Hamliton, Ohio.
Michigan Stove Co., Chicago, Ill.
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Portsmouth Stove & Range Co., Portsmouth, O.
Rathbone, Sard & Co , Albany, N. Y.
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Stamford Foundry Co., Stamford, Conn.
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Western Stove Mfg. Co., St. Louis, Mo.

Stoves and Ranges, Gas.

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Stoves and Ranges, Oil, Vapor and Gasoline.

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Glazier Stove Co., Chelsea, Mich.
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Tea Kettles.

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Tin Plate Decorating.

Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.

Bruce & Cook, 186 to 190 Water St. N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Cleveland Tin Plate Co., Cleveland, O.
Coe, Jas. A. & Co., Newark, N. J.
Dunlap, John Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Lyon, Conklin & Co., Baltimore, Md.
Merchant & Co., Inc., Philadelphia, Pa.
Merry & Clark, 535 to 547 W. 15th St. N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Moorhead-McCleane Co., Pittsburgh, Pa.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J. M. & L. A., Cleveland, Ohio.
Sanderson & Peckham, Detroit, Mich.
Taylor, N. & G. Co., Philadelphia, Pa.
U. S. Iron & Tin Plate Mfg. Co., Demmler, Pa.

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Kieckhefer Bros. & Co., Milwaukee, Wis.

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Curtis & Curtis, Bridgeport, Conn.
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Trimont Mfg. Co., Roxbury, Mass
Wells Bros. & Co., Greenfield, Mass.

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Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St. N. Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Keene, Geo. C. & Co., Cincinnati, O.
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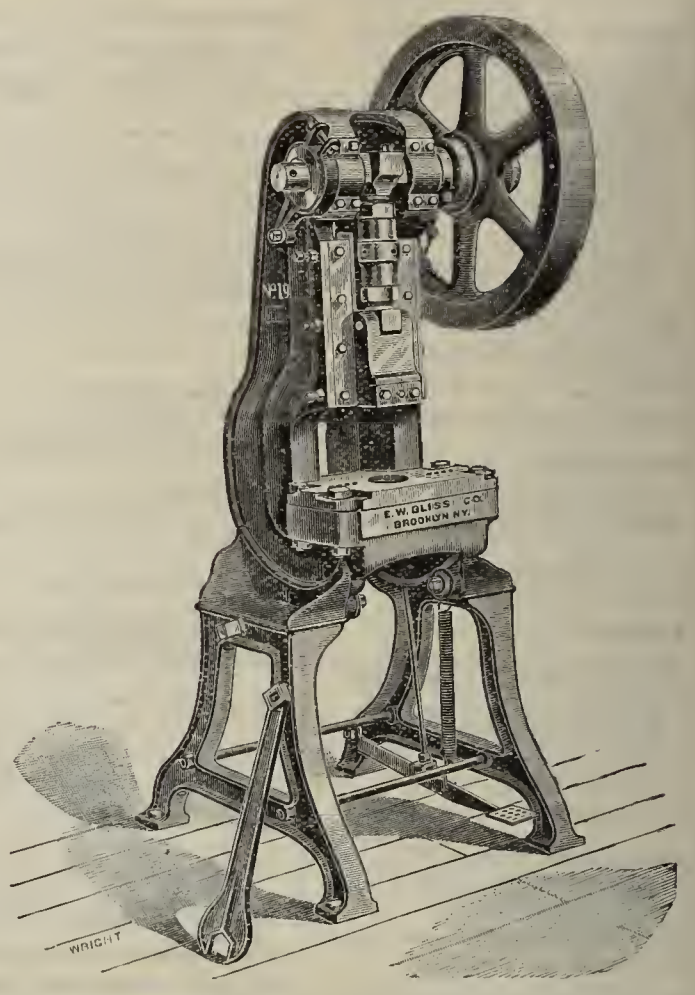
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FIG. 1


FIG. 2.


FIG. 3.


FIG. 4.

Fig. 1. Represents pipe set up and is perfectly smoke tight.
Fig. 2. Represents an end view of pipe and shows construction of seam.
Fig. 3. Represents top of joints spread and packed for shop or domestic use.
Fig. 4. Represents pipe packed for shipment. It is rolled in paper and is shipped at 4th class freight rate and in car lots at 5th class.

It is made in all sizes and of all grades of Iron.

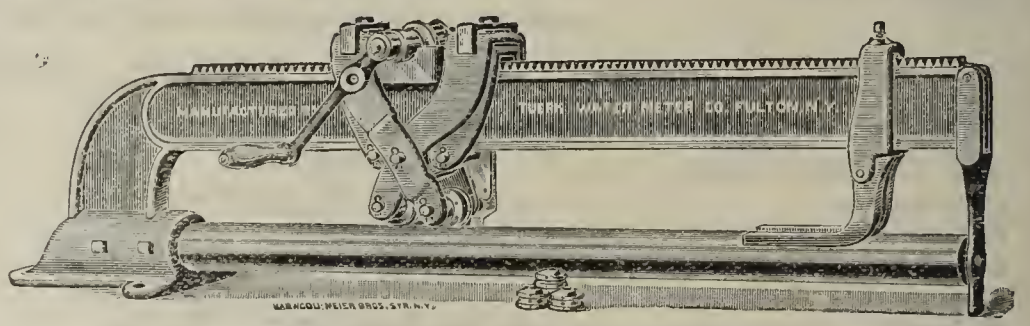
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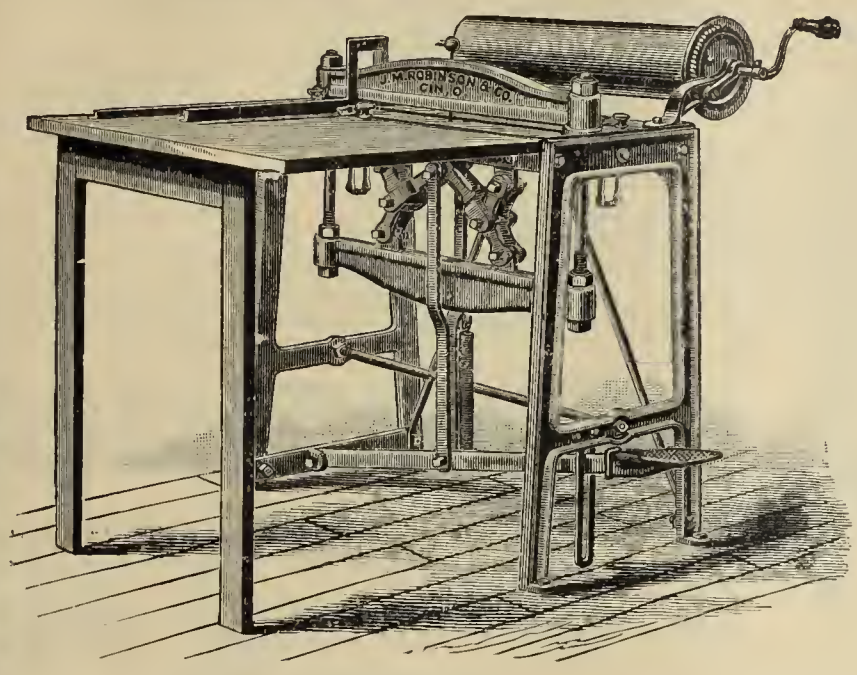
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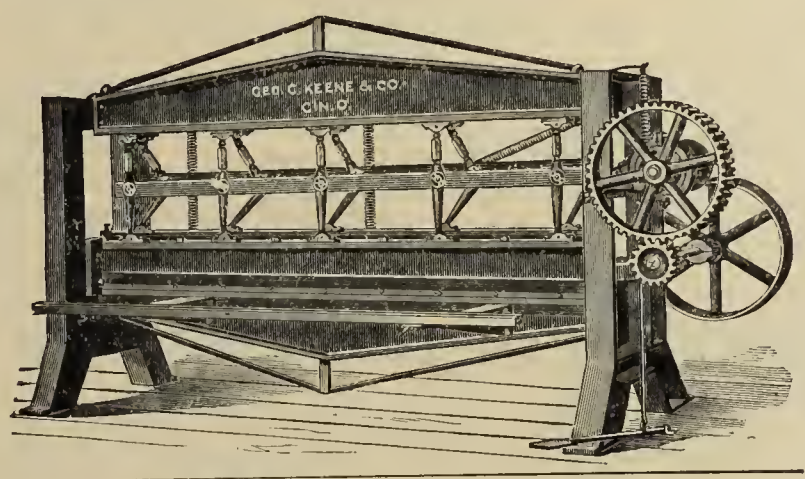
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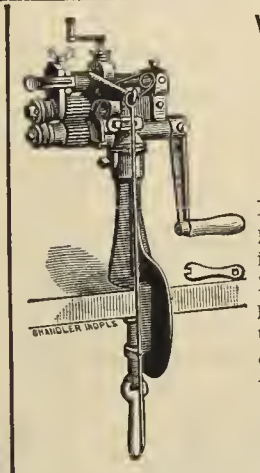
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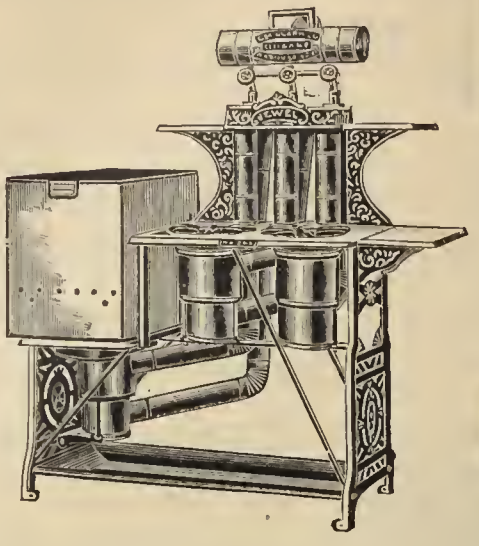
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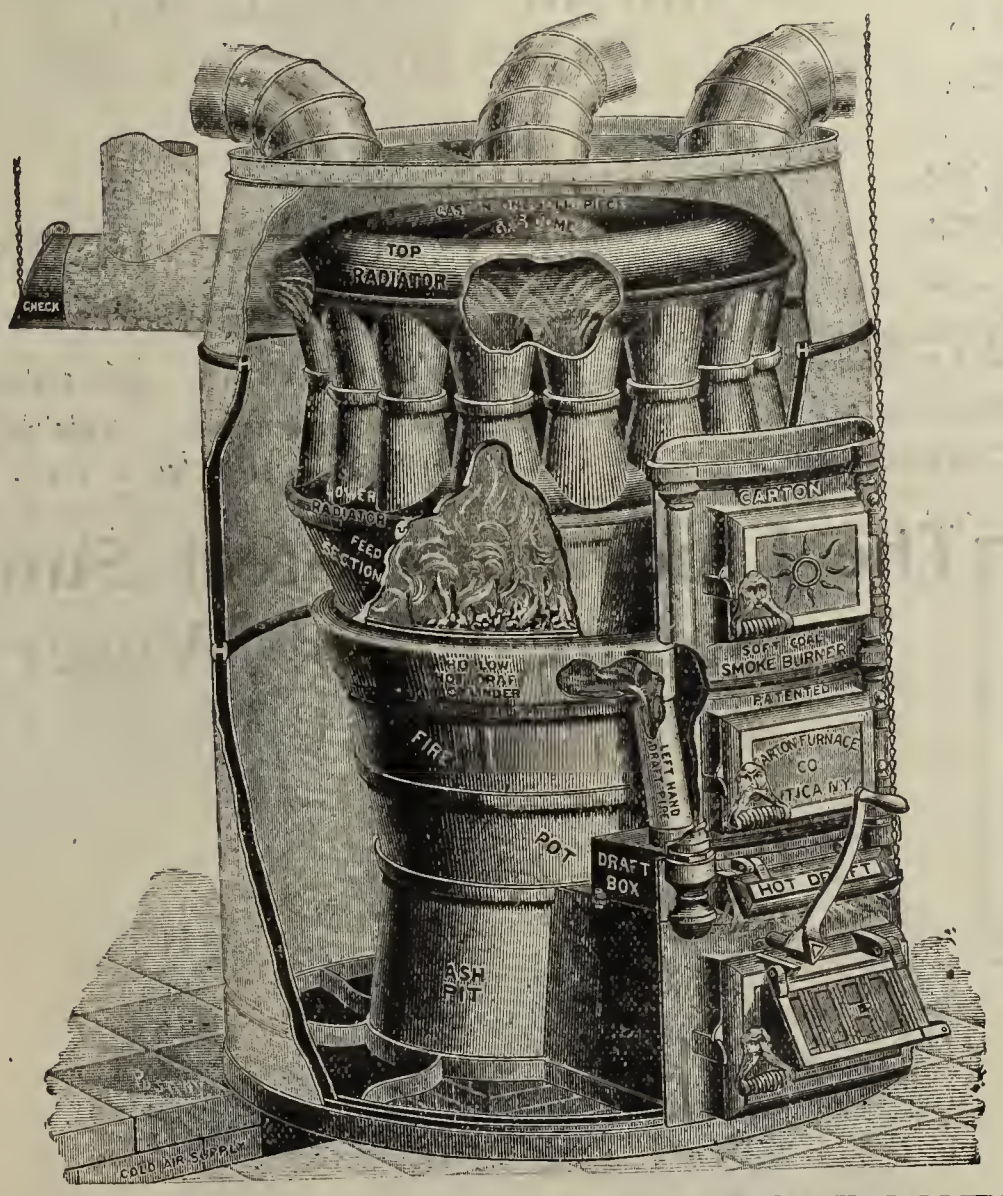


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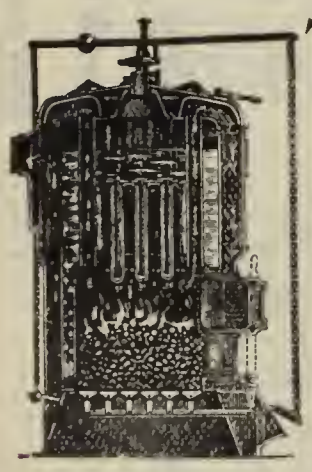
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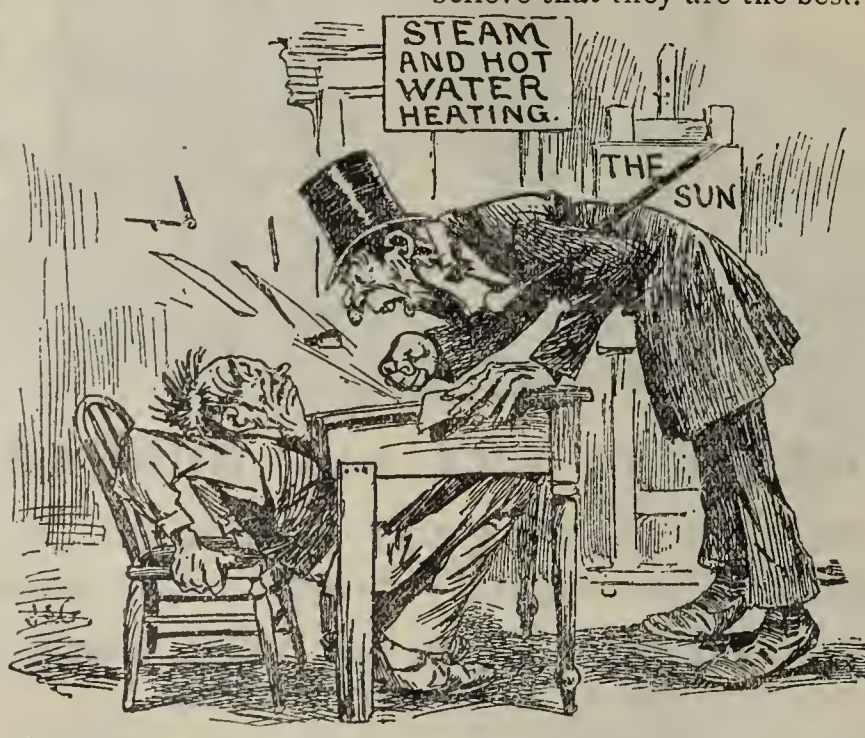
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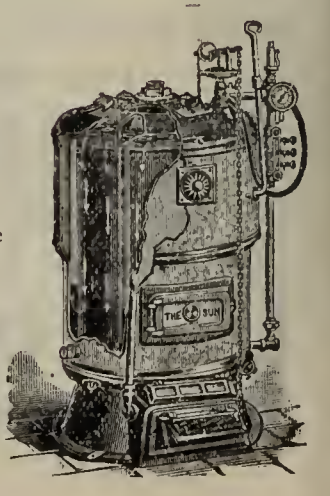
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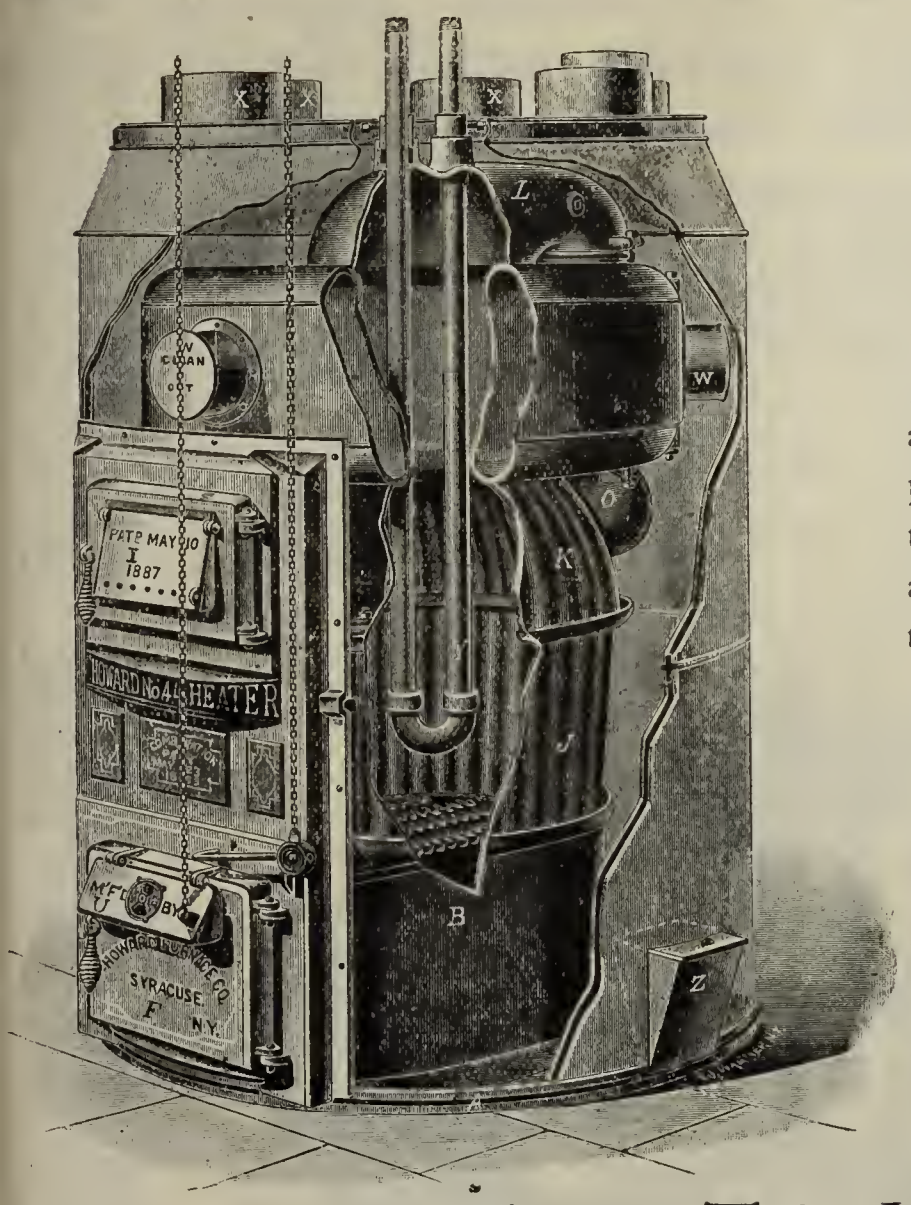


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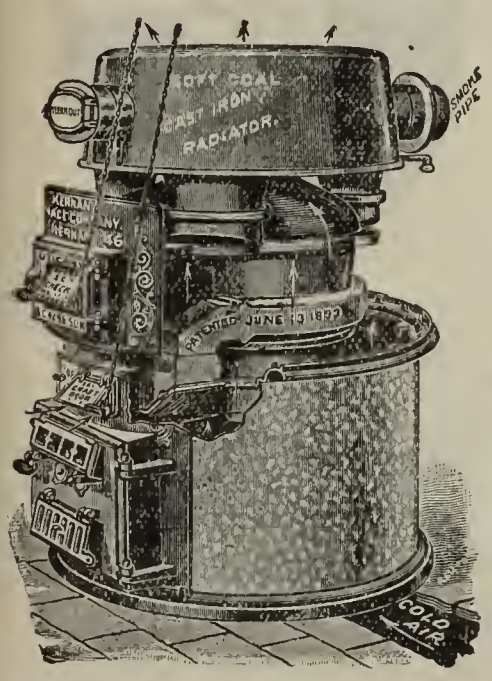
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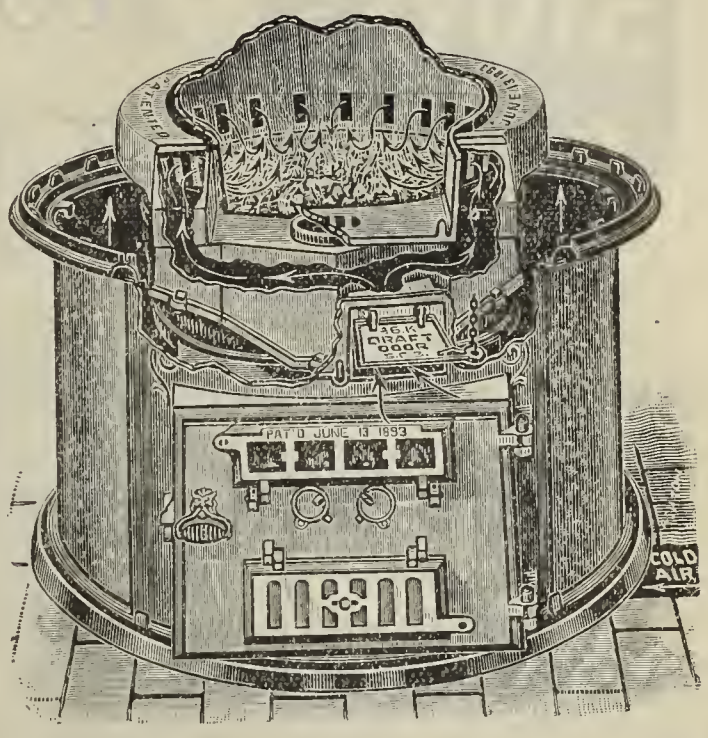
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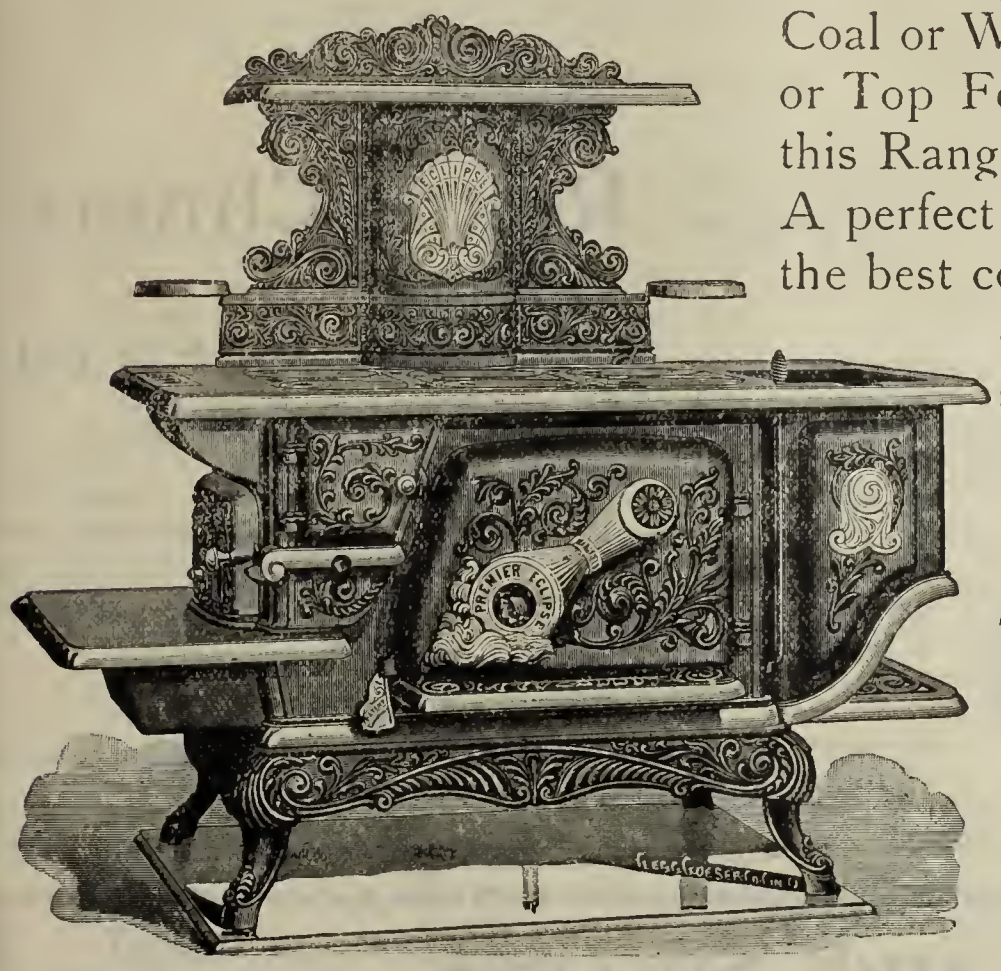
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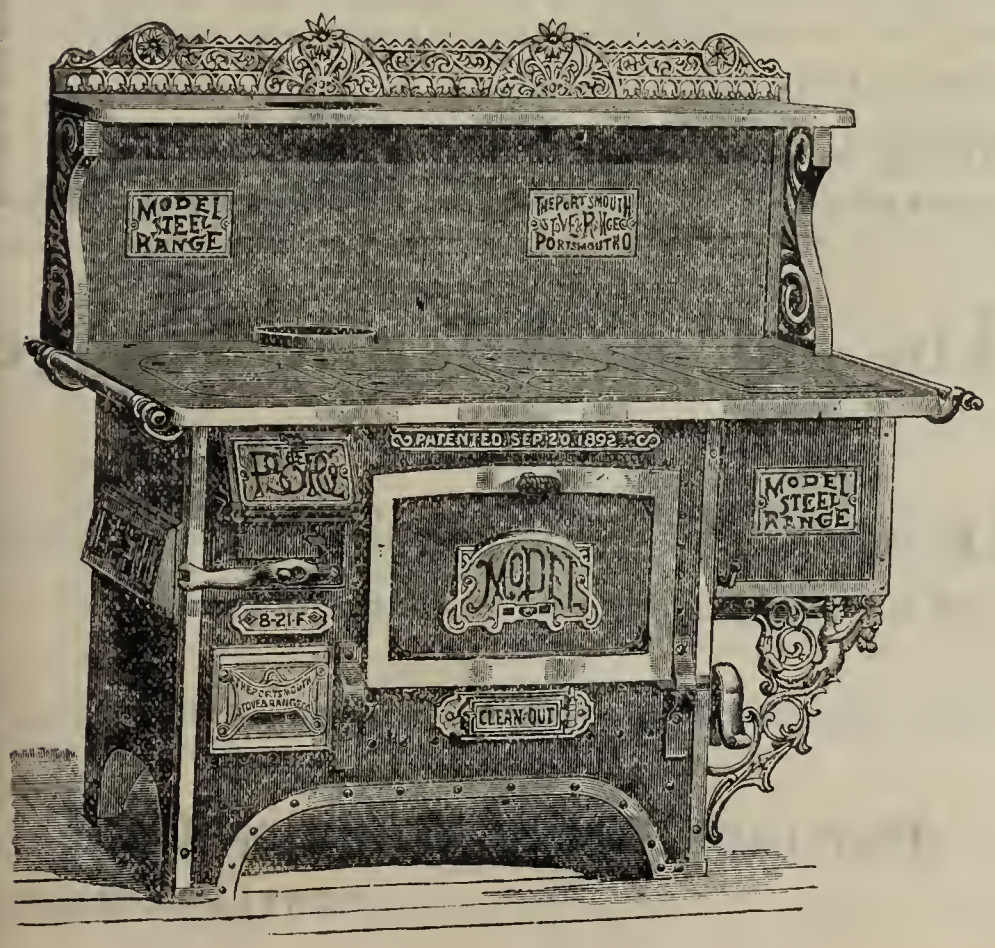
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AKRON, OHIO.

Among the Special

Constructive features of the Round Climax are a jointless ash pit, fitted with hinged draft valve in ash pit door, which can be regulated by a thumb screw to make an almost absolute **AIR TIGHT ASH PIT.** Has large ash pan, draw center shaking grate (manipulated from the outside), and is handsomely trimmed with nickel.

With **one bucket of soft coal** weighing 26 pounds fire has been retained **sixty-nine hours** in the No. 16 Round Climax.

Ferrosteel and Success.

A GREAT COMBINATION

Customers are writing us as follows:

"You have a very desirable Range in the Ferrosteel. The Oven, Fire Box and Ash Pan are perfect, and I expect to have a large trade in this line of Ranges."

"The Ferrosteel Range is received, and is all you claim for it."

"I have sold the Ferrosteel Range and it is all right. Enclosed is order for more, and shall sell quite a number this fall. It is a very taking Range."

Of course Ferrosteel Ranges are a success, because Ferrosteel Metal has no equal for stove construction. Ferrosteel Ranges right in working qualities and taking in appearance. The Ferrosteel Factory is situated so that we can secure best freight rates to any point in the United States.

Inquiries Cheerfully Answered.

The Dippo Manufacturing Co. Cleveland and Chagrin Falls, Ohio.



The Ideal Atlantic Range

A NEW MEDIUM PRICED RANGE.

DESIGNED for a leader to sell in the same class with highest grade goods, but at a lower price.

Every Dealer Should Have a Sample of this Stove.

—SEND FOR PARTICULARS.—

Portland Stove Foundry Co.,

PORTLAND, MAINE.

Lamp Stoves.

We call attention to our widely known standard lines of **LAMP STOVES:**

FLORENCE,
FAIRY QUEEN,
IRON CLAD,
AMERICAN,
CHAMPION,
TOM THUMB,
GYPSY.
VOLUNTEER,
RELIANCE,
GLOBE,
MONARCH,
SUN,
COLUMBIA.

ALL OF OUR STOVES ARE PROTECTED BY PATENTS THAT WE OWN.

OILGAS.

Have you seen our **IMPROVED OILGAS BURNER FOR 1894?** We have in this burner everything that could possibly be desired.

1st. SIMPLICITY.
2d. DURABILITY.
3d. Vaporizing ordinary Kerosene Oil in less than one minute from the time of first applying match.
4th. Vaporizing Gasoline instantly on applying match.
5th. Producing and maintaining a perfect blue flame of intense power.
6th. All vaporizing is done directly within the burner, thus dispensing with all complication, such as drip pipes, cups, elevated cans, &c.
7th. Absolute safety; you can burn either kerosene oil or gasoline with perfect impunity and at pleasure and with the same satisfactory results.

To sum it all up in a very few words, **we have the simplest, safest and best Gasoline Vapor Cook Stove ever produced, and the only Kerosene Oil Vaporizing Cook Stove in the world.**

OIL AND GAS COOK STOVES.

We are the largest manufacturers in the world of Oil and Gas Stoves. Over two hundred different styles and sizes for cooking and heating purposes.

Our **OIL COOK STOVES** include the following popular lines:

GRAND (Circular Burner),
MONITOR,
CHAMPION,
GARLAND,
ADAMS & WESTLAKE.
CROWN,
SUMMER QUEEN,
GEM,
PROGRESS,
NEW QUEEN,
RELIANCE.

GAS COOK STOVES.

Our Gas Cook Stoves include the well-known **CABINET (Range), STANDARD, ACTIVE, ROYAL and RELIANCE (Hot Plates), ETNA, CENTENNIAL, DOME and CONE** (low Stoves with Cast Iron Burner and Russia Iron Cylinders).

GAS HEATERS.

Our Gas Heaters include the **CHAMPION, RADIANT, SUNSHINE, CONE.**

CIRCULAR BURNER OIL HEATERS.

Our Circular Burner Oil Heaters include all stoves of this class that have an established reputation: as the **GRAND FLORENCE, CHICAGO, AMERICAN, GLOBE.**

FLAT BURNER OIL HEATERS.

We make numerous sizes and styles of Flat Burner Oil Heaters.

MISCELLANEOUS.

We manufacture **TAILORS' GAS STOVES, LAUNDRY GAS STOVES, GAS IRONS for TAILORS and DRESSMAKERS, NURSERY BURNERS, BROODER STOVES, GLASS OIL CANS, GLUE POT HEATERS, &c., &c.**

We manufacture all that we have herein enumerated, from the raw material to finish.

CENTRAL OILGAS STOVE COMPANY,

Boston. New York. Chicago. San Francisco.



WILLIAM VANDERMAN,

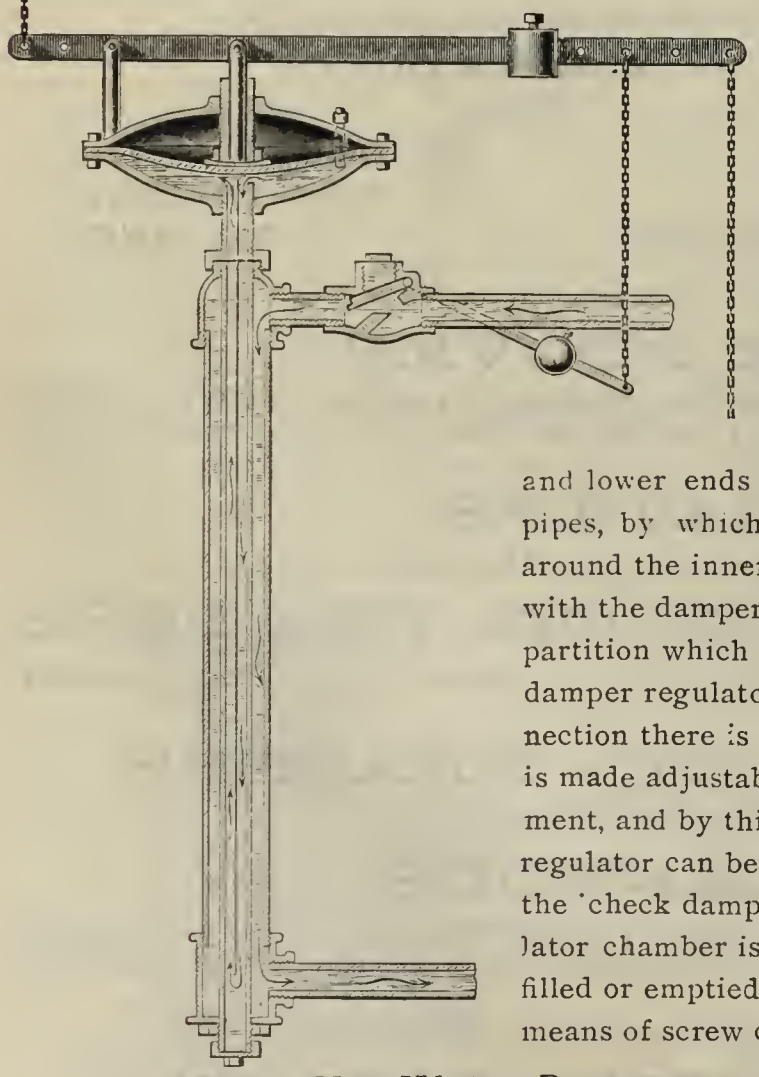
One of the best known of New England Heating and Sanitary Engineers. A thoroughly practical man of inventive ideas, and of 27 years' experience as a Steam and Hot Water Engineer, having carried on a Heating and Ventilating business for the past 16 years. The original inventor of the use of rubber for automatic air valves. and the inventor of many other valuable devices. Now manager and controlling stockholder of the Vanderman Plumbing & Heating Company of Willimantic, Conn.

AN AD

Of Interest to Boards

By WILLIAM

whose line of steam and hot water boilers and hot
the times and consist of a large variety to meet all
them cheaper than any other make of boilers. Of
so constructed that they may be brick set or covere
to meet the demands for all sizes of boilers from t
boilers are the equals if not the superiors of any lin
being put on the market at a less cost than any oth
is made ; it is a valuable feature in this or any oth
could also be licensed to other boiler manufacturers
giving unqualified satisfaction ; but demands upon
devote to the manufacture of these Boilers, and ha
the market. Will sell all rights and patents, or wi
interested can acquire any information desired by



Vanderman Hot Water Damper Regulator.

The Vanderman Hot Water Damper Regulator is very simple in construction and is adapted to any make of hot water boilers, and its operation depends on the expansion of water or other liquids ; it consists of an outer cylinder which has a connection at its upper and lower ends with the boiler or flow and return pipes, by which connection the water circulates around the inner pipe. The pipe which connects with the damper regulator chamber has a disc or partition which makes a positive circulation to the damper regulator chamber. On the flow pipe connection there is placed a swing check valve which is made adjustable by moving of the chain attachment, and by this movement the operation of the regulator can be made to close the draft and open the check damper as desired. The damper regulator chamber is so arranged as to permit of it being filled or emptied after it is placed in position by means of screw caps placed at top and bottom.

Vanderman Hot Water Damper Regulator.



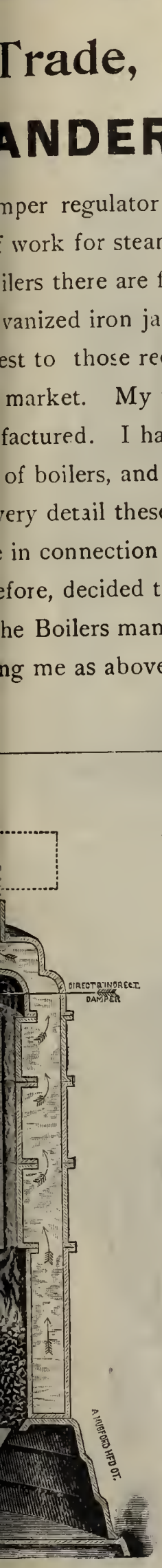
Vanderman Tripl
Hea

NOUNCEMENT

Trade, Foundry Managers and Capitalists,

ANDERMAN, Willimantic, Conn.,

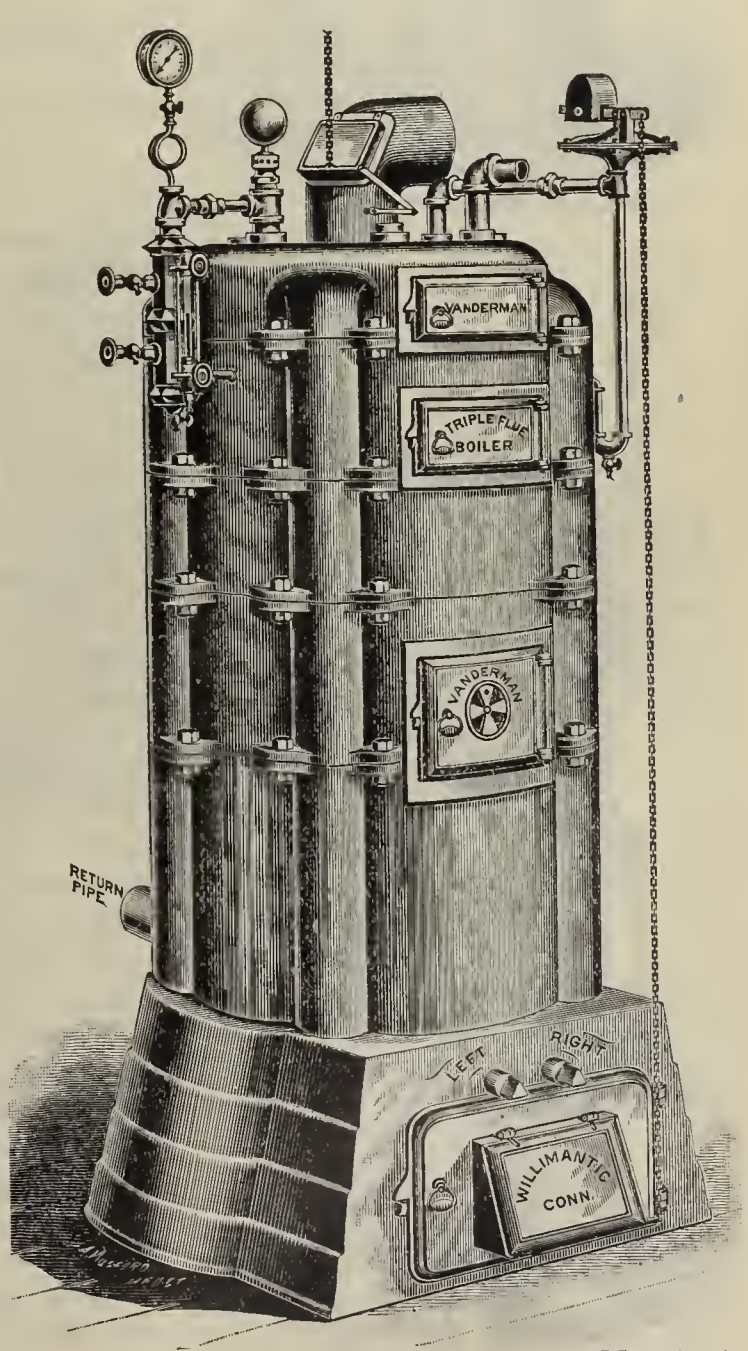
mper regulator are shown on this and following pages. I make a line of boilers that are up to
work for steam or hot water heating, and with my patented construction I can manufacture
ilers there are five different makes equally well adapted for steam or hot water heaters. They are
vanized iron jacket, or set portable and covered or not with asbestos cement, and they are adapted
est to those required in the largest public buildings, for either steam or hot water heating; these
market. My patented construction for connecting the different sections will allow of the boilers
factured. I have a peculiar economic method of construction, by the use of which a large saving
of boilers, and other manufacturers could be licensed to use it. The hot water damper regulator
very detail these boilers are first class and up to the times and the large number now in use are
in connection with the Vanderman patented specialties are such that I have not the time to
efore, decided to dispose of them to responsible parties who will manufacture and place them on
he Boilers manufactured on royalties. This is a rare opportunity for the right party, and those
ng me as above



e Hot Water

The Vanderman Triple Flue Boilers.

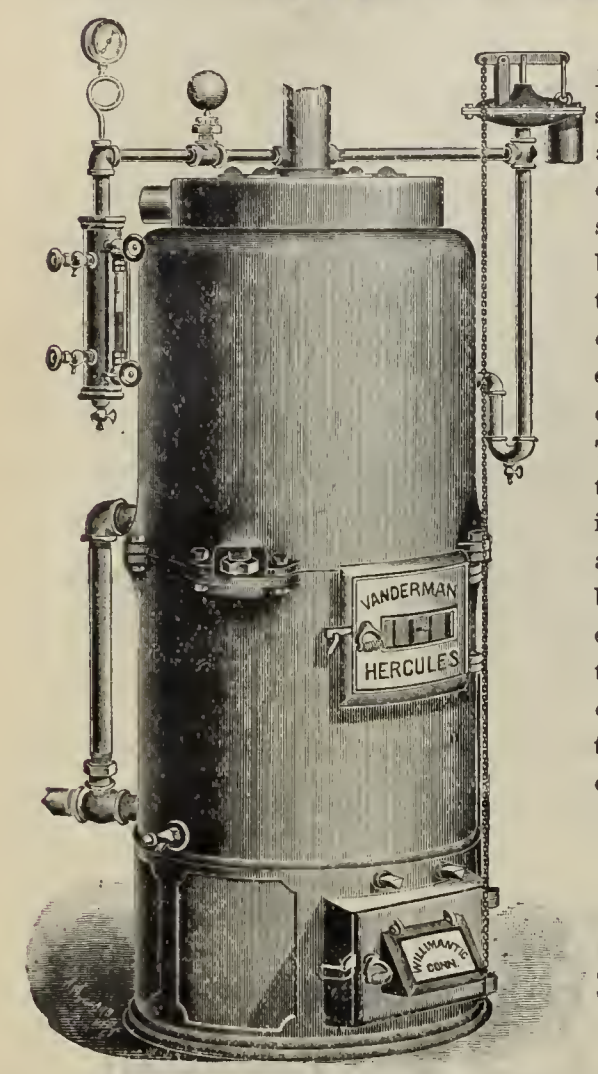
The Vanderman Triple Flue Steam and Hot Water Heaters are made up from a number of sections with a number of large water ways extending from the fire pot section to the dome section. which permits of a free circulation. The connecting water ways are made with an improved connection requiring no machine labor, and yet it is strong and an everlasting connection. It has a large crown sheet fire surface, and the heated gases after striking the crown sheet pass to the dome section through a row of flues which are located at the outer edge of the fire pot and extend to the dome; an inner row of flues extend from the dome to the upper side of fire pot section, and from the fire pot section a large central flue extends to the smoke outlet; by this arrangement the heated gases pass the length of the boiler three times. It has a large amount of heating surface and has a direct and indirect draft and all the fire surface is so arranged as to be easily cleaned.



Vanderman Triple Flue Steam Heater

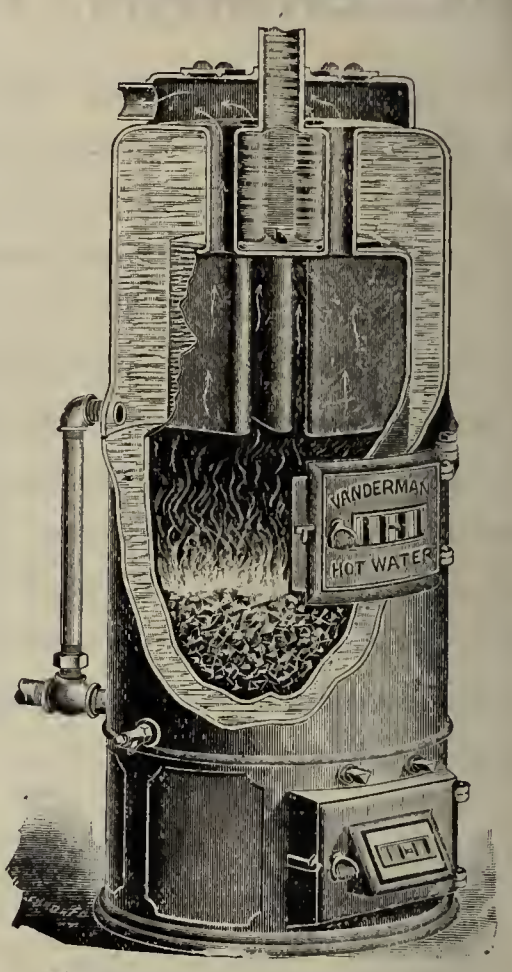
READ ANNOUNCEMENT OF WM. VANDERMAN ON PAGES 12 & 13.

HERCULES BOILERS.



VANDERMAN HERCULES STEAM HEATER.

The Vanderman Hercules Steam or Hot Water Boilers consist of two sections which are made together by a lock nut nipple, the upper section only being tapped out and the sections being held together by short bolts, the joints being made tight by the lock nut being screwed down on to the packing; this makes an easily made joint and saves in the cost of the construction of the boiler. The fire surface is all directly over the fire and consists of wings extending out from the sides of the boiler and connected to the crown sheet between the flues; a number of flues extend from the crown sheet through the dome to the smoke bonnet. All of the fire surface is easily cleaned through the smoke bonnet and fire door. The circulation is all vertical.



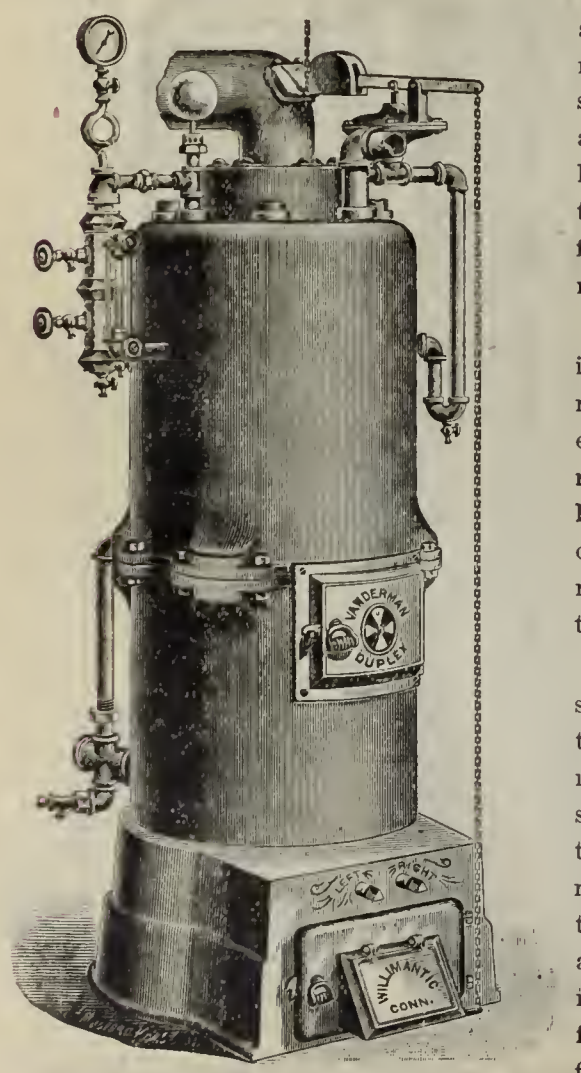
VANDERMAN HERCULES HOT WATER HEATER.

The Vanderman Duplex Steam and Hot Water Heaters.

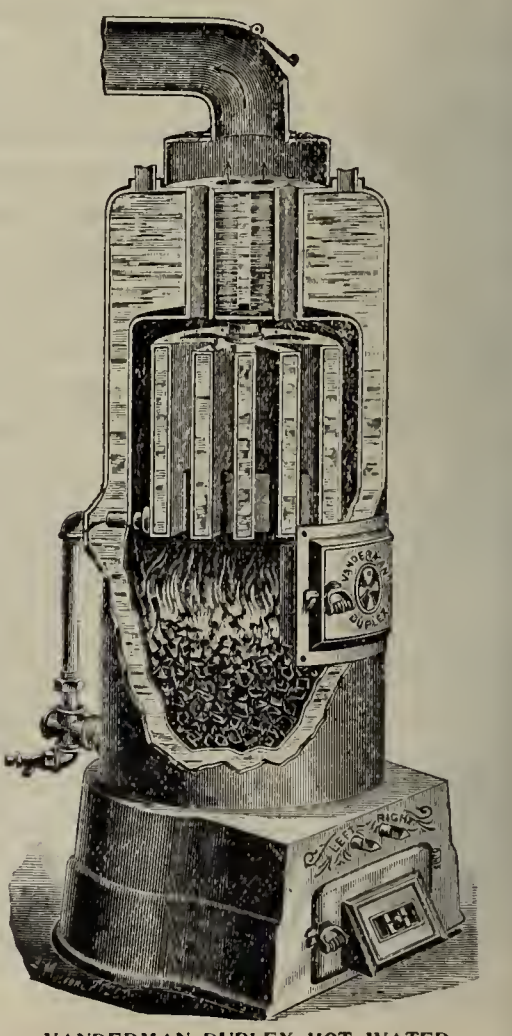
The Vanderman Duplex Steam and Hot Water Heaters consist of two sections and an inner boiler; the inner boiler is screwed into the under side of the dome section, and has a connection extending from the lower side of the inner boiler to the tee on the return at the bottom of fire pot; with these connections it makes a boiler within a boiler.

Above the inner boiler and extending through the dome there are a large number of flues; the inner boiler has, extending lengthwise, one or more rows of triangular flues and are in line with the flues in the dome. The openings in the top of the smoke bonnet permit of ready cleaning of all the flues and the inner boiler.

The construction of this boiler is such as to bring a large amount of the heating surface where the direct rays of the heat reflect on the heating surface. The circulation is all vertical and free. The water way connecting the top and bottom sections together is an improved construction and requires no machinery work, as it can be put together as it comes from the foundry, and it makes a first-class connection.

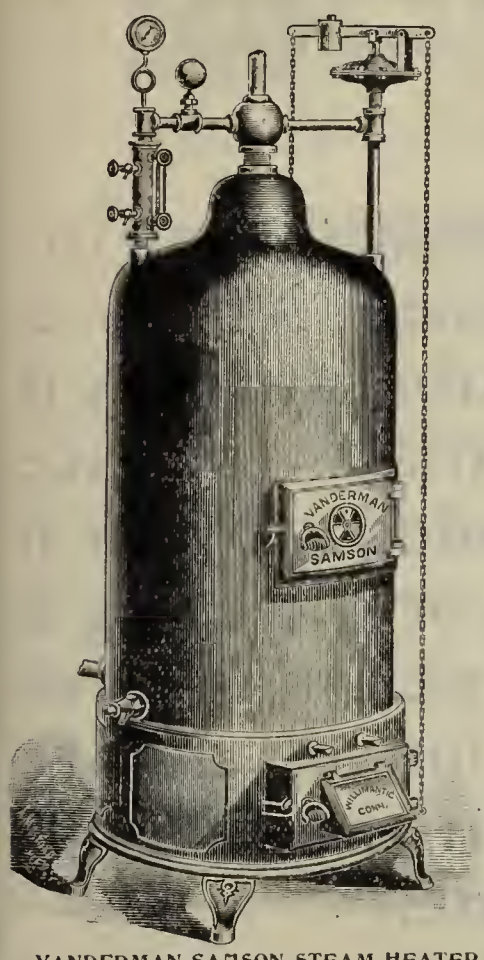


VANDERMAN DUPLEX STEAM HEATER.



VANDERMAN DUPLEX HOT WATER HEATER.

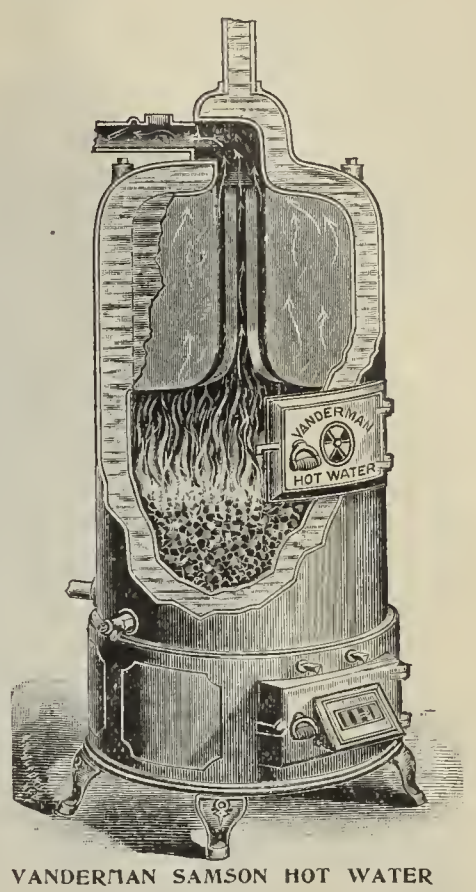
READ ANNOUNCEMENT OF WM. VANDERMAN ON PAGES 12 & 13.



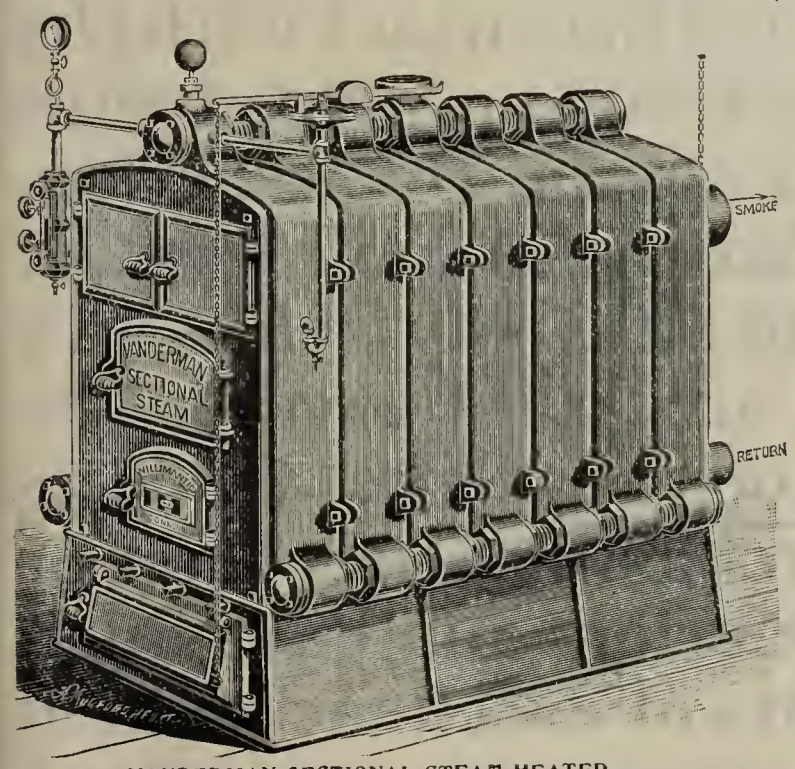
VANDERMAN SAMSON STEAM HEATER.

SAMSON BOILERS.

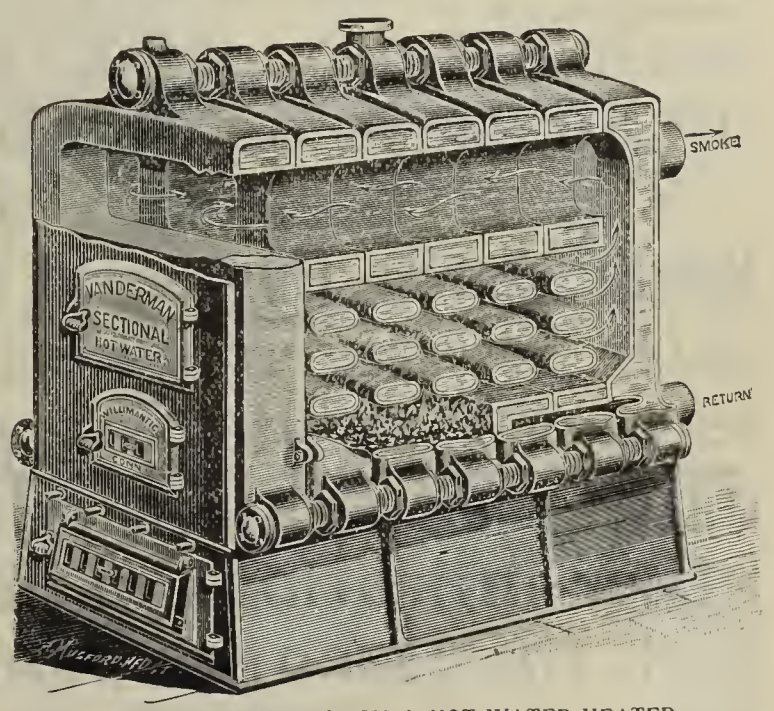
THE VANDERMAN Samson Steam and Hot Water Boilers are especially adapted for steam and hot water heating, for the small class of work. It is a one-piece boiler and would be suitable for heating hot water for baths or general purposes, or for heating cottages by either steam or hot water, and would make a powerful and cheaply constructed boiler. It has a large fire surface directly over the fire which consists of wings extending out from the side of boiler, and an opening in the side and top of boiler which permits of a free and easy circulation. When the boiler is used for steam, the steam globe is screwed into the top of the boiler. The number and size of the wing are made in proportion to the size of the fire pot. All of the fire surface is easily cleaned from the fire door.



VANDERMAN SAMSON HOT WATER HEATER.



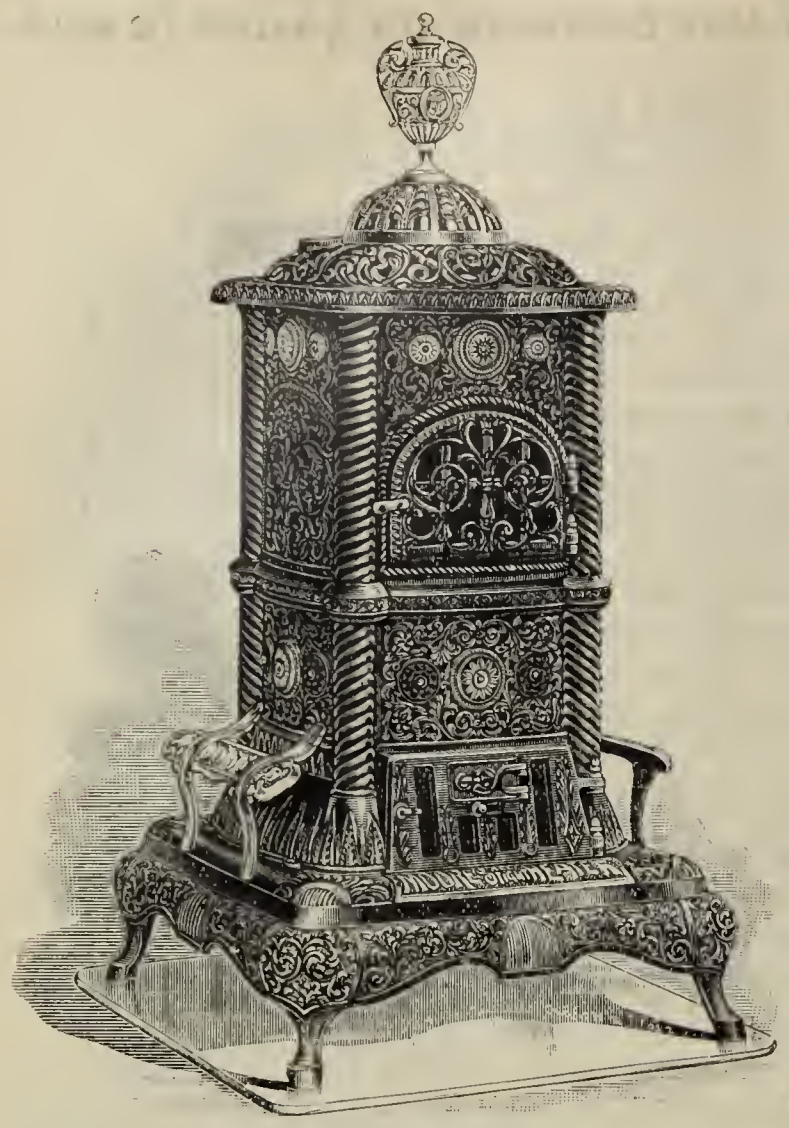
VANDERMAN SECTIONAL STEAM HEATER.



VANDERMAN SECTIONAL HOT WATER HEATER.

The Vanderman Sectional Steam or Hot Water Heaters.

THE VANDERMAN Sectional Steam or Hot Water Heaters are more especially adapted for the larger class of work, such as schools, churches and public buildings. It makes a powerful, economical and durable heater, with large and effective fire surface, and all the fire surface is so arranged as to be easily cleaned. In the construction of this heater, I claim a great advantage in the cost of construction over any other sectional heater in the market, as I can put the connections together as they come from the foundry without any machine labor, with my patented construction for making up the sections, and also doing away with the three connecting drums that are required on other makes of sectional boilers. The heating surface in this boiler is so arranged as to require the heated gases to pass the length of the boiler three times.



MOORE'S AIR TIGHT HEATER

PATENTED



MOORE'S AIR TIGHT HEATER is an incased stove. Substantially it is a small furnace surrounded by an open work design which permits free circulation of air to and from the fire pot and dome.

The fire pot and dome are of heavy cast iron and do not come in contact with the casing at any point. It is also provided with an air-tight ash pit of special construction.

These necessary features, which make MOORE'S AIR TIGHT HEATER the best and most easily sold stove now on the market, are fully covered by letters patent No. 499306. The trade is cautioned against purchasing sheet iron or other imitations of inferior quality, which lack the essential points of excellence which have made MOORE'S AIR TIGHT HEATER so remarkably successful.

We want live agents in all unoccupied territory. If you do not know all about this it will pay you to drop us a postal card. MOORE'S AIR TIGHT HEATER not only sells easily but sells at a profit.

JOLIET STOVE WORKS, Sole Manufacturers, JOLIET, ILL.

Save ½ the Fuel Bill.

HEATED THREE ROOMS AND A STAIRWAY

WILLIAM RESOR & Co.: Through the recommendations of those who had used them I bought a Monitor Parlor stove at Martin's hardware store here and will say that it is the best stove I ever had. I heated three rooms and a stairway and the fire was not out from the time I bought the stove until the first of March. It heated the floors of my rooms like a furnace. It is a great economizer of fuel.

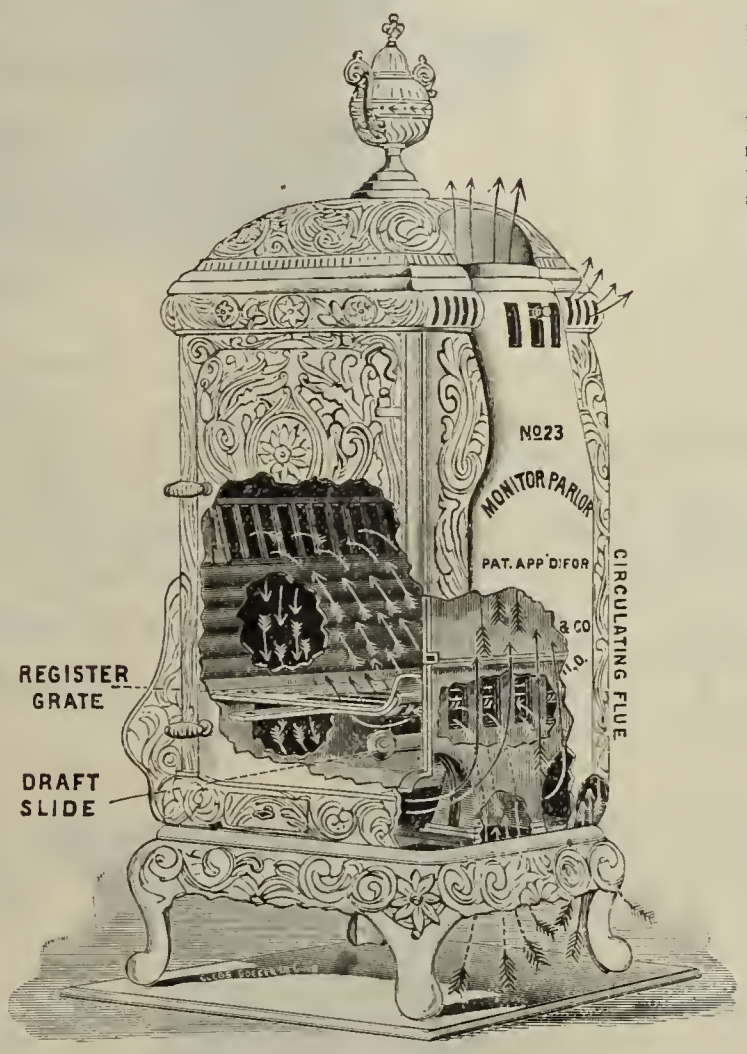
Yours very truly,
WILLIAM EASTERDAY, Albion, Ind.

NEVER FAILS TO DO JUST WHAT IS REQUIRED.

MESSRS. GILMORE & JONES, Hardware Dealers, Mabel, Minn.—Gentlemen: The Monitor Parlor wood heating stove purchased from you last winter has given the best of satisfaction. It holds fire all night perfectly; it is under perfect control; in fact it never fails to do just what is required of it either in the coldest winter weather or in the warm spring months.

The ordinary wood heating stoves would never find a purchaser if the difference between them and the Monitor Parlor was generally known.

Very truly,
F. A. DUXBURY, Mabel Minn.



BEST STOVE TO CONTROL THE FIRE.

WILLIAM RESOR & Co.: We have handled the Monitor Parlor this season and must say it is the best stove to control the fire with we ever saw, and our customers say the same.

Yours truly,
J. J. HAWLEY & SON,
Hardware and Stoves, Manchester, Iowa.

WILL TAKE THE LEAD.

WILLIAM RESOR & Co.: We believe the Monitor Parlor wood base heater will take the lead of a l parlor heaters on account of its peculiar construction for holding fire a long time and for economy of fuel.

Yours truly,
GRAHAM & MCGOWAN,
Hardware and Stoves, Brookfield, Mo.

50 BELOW ZERO.

MESSRS. WILLIAM RESOR & Co.: I used one of your No. 25 Monitor Parlor stoves last winter and am pleased to te tify to its good qualities. With the thermometer at from 45 to 50 degrees below zero it furnished ample heat and held fire all night perfectly. I find it very economical in the use of fuel.

Respectfully,
MRS H. H. BILLINGS, Perham, Minn.

Monitor Parlor Wood Base Heater.

3 Sizes,
21-inch Wood.
23-inch Wood.
25-inch Wood.

The best seller ever produced. Secure the Agency and control the trade in your section. Write for our booklet,

"THE CHEERY WOOD FIRE."

Wm. Resor & Co.,

CINCINNATI, OHIO.



We manufacture ranges for both natural and manufactured **Gas, Steel Ranges** for all kinds of fuel, Cast Ranges with **Patent Steel Oven** improvements, etc.

Correspondence Solicited.

CHICAGO & ERIE STOVE CO.

CHICAGO, ILL., and ERIE, PA.

Luther & Lederhos,

MANUFACTURERS OF

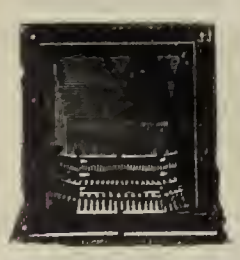


Gas and Oil Stoves,

30 Cliff St., N. Y.

Write for Catalogue and Prices.





Established 1827.

W. Jackson's Sons.

Manufacturers and Importers of Grates, Open Fire Places, Fenders, Fire Irons Andirons, Tiles, &c.

Office and Showrooms, 246 Front Street, within thre minutes of Fulton Ferry. Factory, 268 Water Street New York.

— MRS. FLAHERTY (proudly): "Do yez hear me Mary Ann singing?"

Mrs. Dooley: "It's her voice Oi wish Oi had, Mrs. Flaherty."

Mrs. Flaherty (unsuspiciously): "An' phwat would th' loikes av you do wid sich a voice, Mrs. Dooley?"

Mrs. Dooley: "Oi'd toie a stone to it and t'row it to the bottom av a well."—*Judge.*

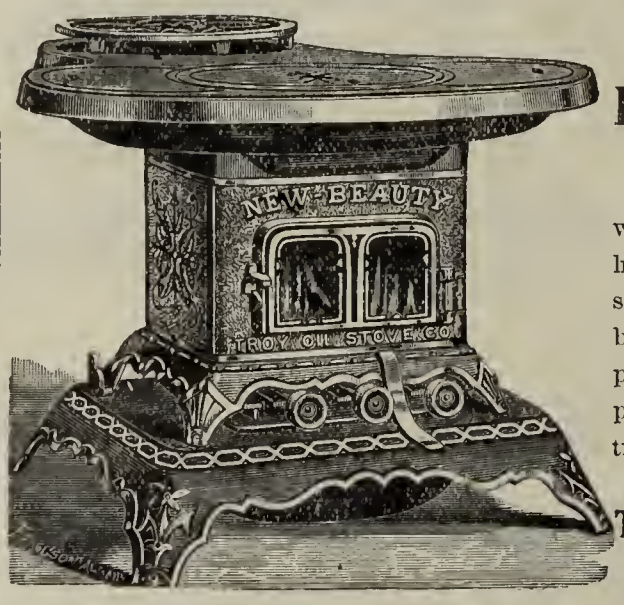


This range was advertised last year with triangular grate. Now it has triangular, duplex, or flat. All that is needed to change from one style to either of the others is a new number-plate. No changing of bricks or grate frame, nor even taking them out.

Let us send you a full description.

THE STAMFORD FOUNDRY COMPANY,

STAMFORD, CONN.



Beware of Infringing Stoves.

Parties dealing in oil stoves would do well to compare the hinge on this stove that the body swings on with others that may be offered them, as we are the patentees of said hinge, and shall protect ourselves against all parties infringing.

TROY OIL STOVE CO.,

TROY, N. Y.



THE

Scollay Hot Water Heater

For Warming Dwellings, Stores, Offices, Churches, Public Buildings, &c.

Also Boilers specially constructed for Greenhouses, Conservatories, Baths, Laundries, &c.

SEND FOR ILLUSTRATED CATALOGUE AND PRICE-LIST.

JOHN A. SCOLLAY,

72, 74 & 76 Myrtle Ave., BROOKLYN, N. Y.

Read these facts about "ESTATE OAKS." If wise, you will secure these magnificent stoves.



AUGUST SCHMITT,
Wholesale and Retail Dealer in
Stoves, Ranges, Mantels, Pumps and Tinware,
EVANSVILLE, IND.

EVANSVILLE, IND., June 14th, 1894.

Messrs. F. & L. KAHN & BROS., Manufacturers, Hamilton, Ohio.

Gentlemen: In answer to your inquiry concerning the experience I have had with the ESTATE OAK, I can say that I am very well pleased with the success I have had in handling them. All reports coming in from parties using them have been favorable. Where a stove was sold it always would help sell more in that neighborhood. Its Seamless Ash Pit, Doors with Screw Registers and fine Appearance, Heating and Fire Holding Qualities are the Points with which it recommends itself to the customers. Do not know of any stove in that line which I cousider its equal.

As to my dealings with you, I can say that they have been satisfactory in every respect, which surely has been proven by order already placed with you for next season.

The special advantage in the ESTATE OAK is, it is not an imitatiou of some other stove, as we find in a great many other stoves which the market is flooded with.

Hopiug that we have a good seasou before us, and that our dealings with each other will continue satisfactory as heretofore, I remain

Yours truly,
AUGUST SCHMITT.

STATE OF OHIO, }
COUNTY OF BUTLER. }

Personally appeared before me, a Notary Public, in and for said County and State, Jacob Martin, known to me and who deposeth aud saith:

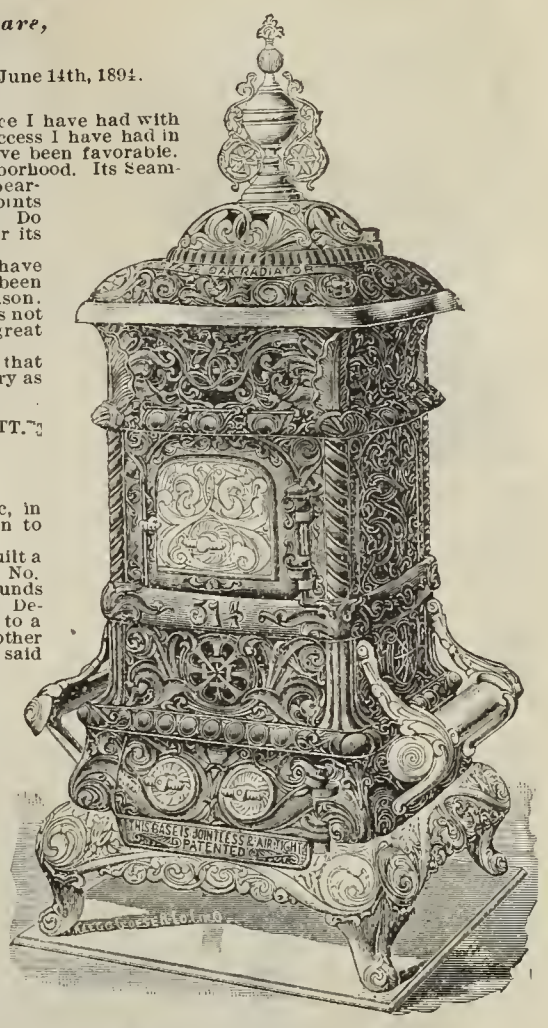
That on Saturday, June 2d, 1894, at 9.40 A. M., he built a fire in a heating stove marked "Estate Oak Radiator No. 514;" that he then weighed and charged fifty (50) pounds of anthracite or hard coal (nut size) into said stove. Deponent further saith, that said stove was connected to a first class flue of about fifty (50) feet, and that no other person but himself had access to said stove during said trial test.

Deponent further saith, that the said fuel continued to burn in and keep said stove hot and that fire was visible therein, beginning on said Saturday, June 2d at 9.40 A. M. until 10.40 o'clock A M of Tuesday, June 5th, 1894, or that in other words, fire and heat were maintained thereiu continuously for a period of seventy-three (73) hours.

Deponent further saith, that ten (10) pounds of the coal originally charged were sifted out of the residue and that only forty (40) pounds were actually consumed during the test and that there were uo clinkers in said residue.

JACOB MARTIN.

Sworn to and subscribed before me this 11th day of June A.D. 1894.
ABRAHAM BALLINGER,
Notary Public.



F. & L. Kahn & Bros., Manufacturers, Hamilton, Ohio.

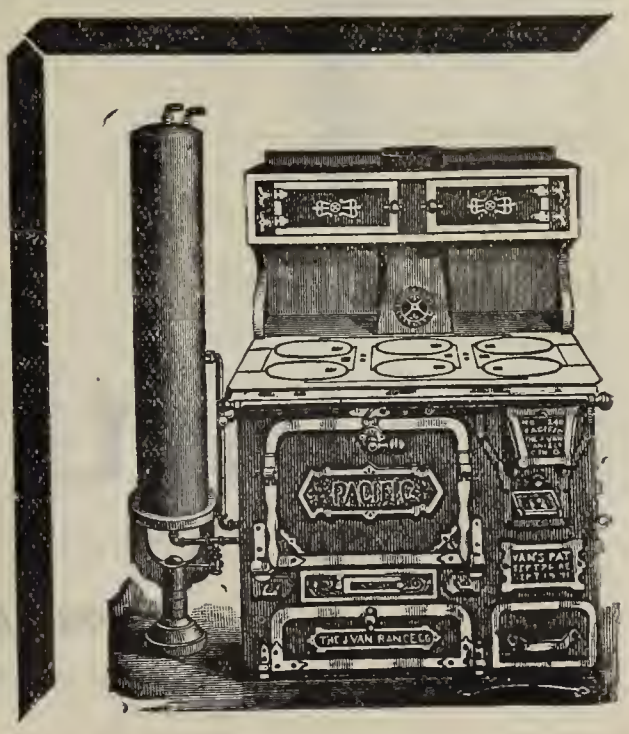
In Re= To Van Ranges.

WHETHER Large or Small, it is a conceded fact that they have for years been the Standard for all Wrought Steel Cooking Apparatus, partially on account of the Workmanship, Design and Finish embodied in their construction, but principally for the reason that they have proven to be better adapted, more durable and far superior in operation than any other similar apparatus.

They are not almost wholly of cast iron, nor have we endeavored to see how light they could be made, but on the contrary, we use the heaviest gauge steel practicable; in short, we construct to last and give perfect satisfaction, depending entirely upon merit and quality.

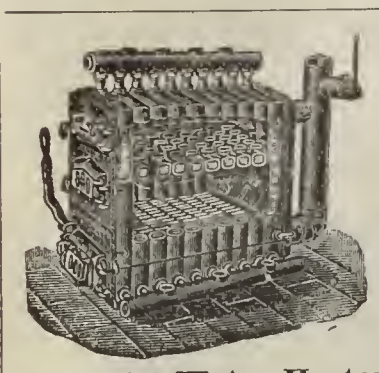
Our ovens may be an inch or two larger, and in many ways we probably give more for the money, but the buyer nevertheless obtains what he pays for and more.

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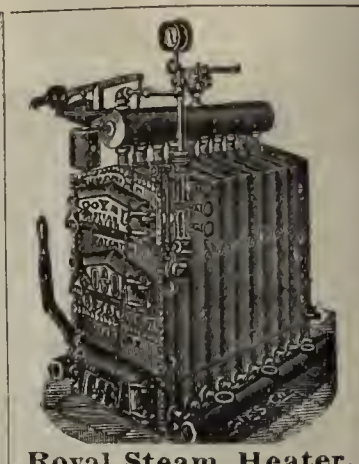


The John Van Range Co.,
Cincinnati, Ohio.

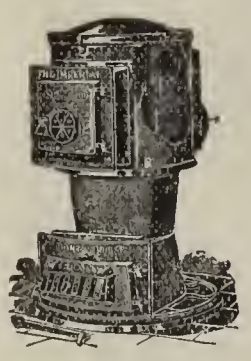
Sold on their Merits,
and not on their Antiquity.



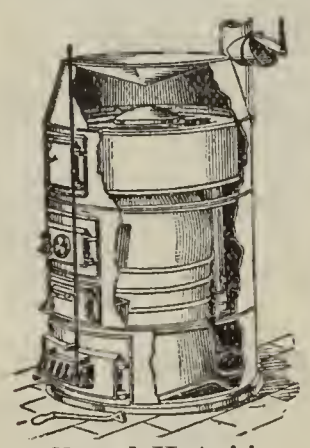
Royal Hot Water Heater.



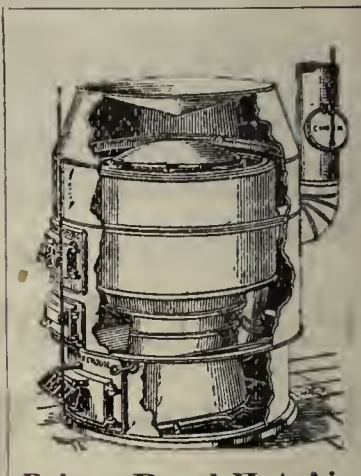
Royal Steam Heater.



Imperial Hot Air Furnace.

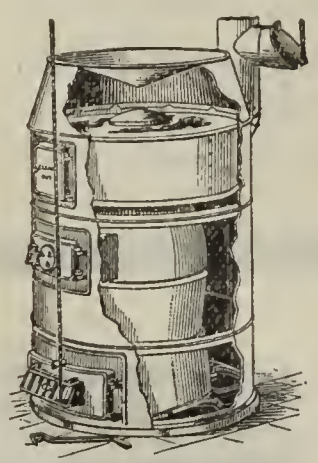


Royal Hot Air Furnace.

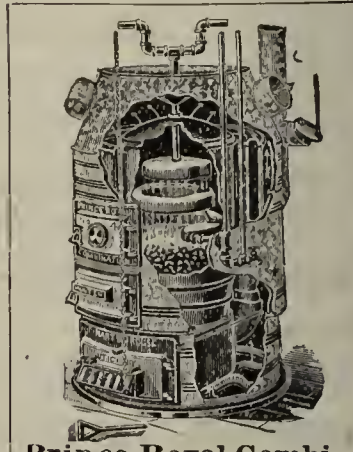


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Royal Victor Hot Air Furnace.



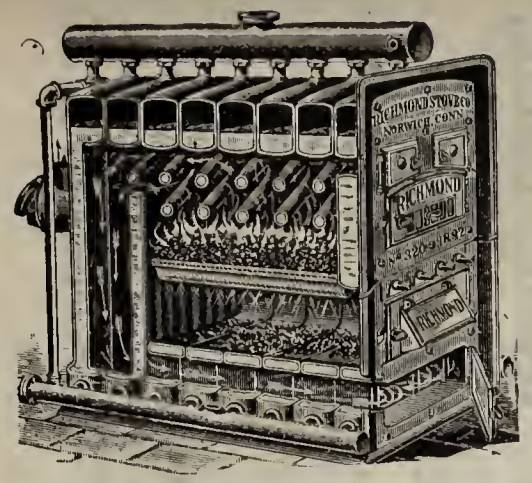
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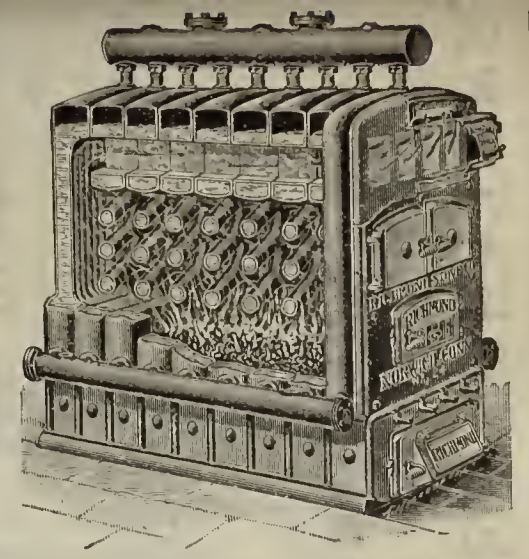
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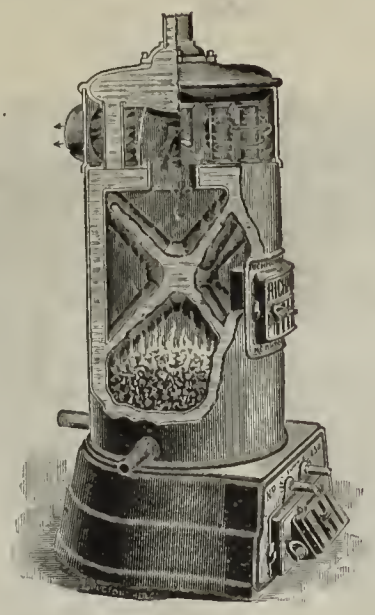
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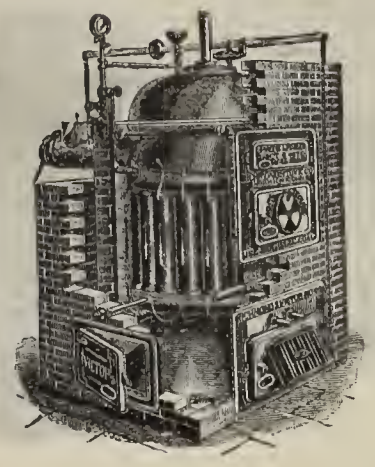


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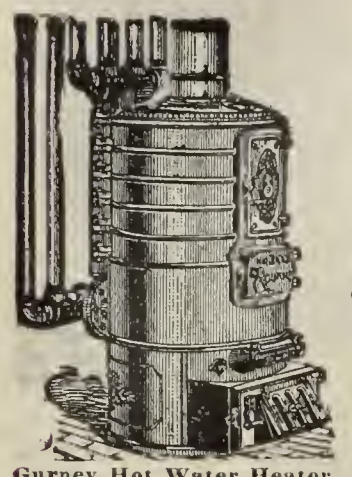


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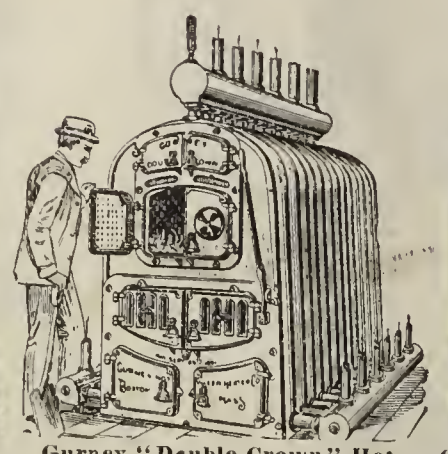
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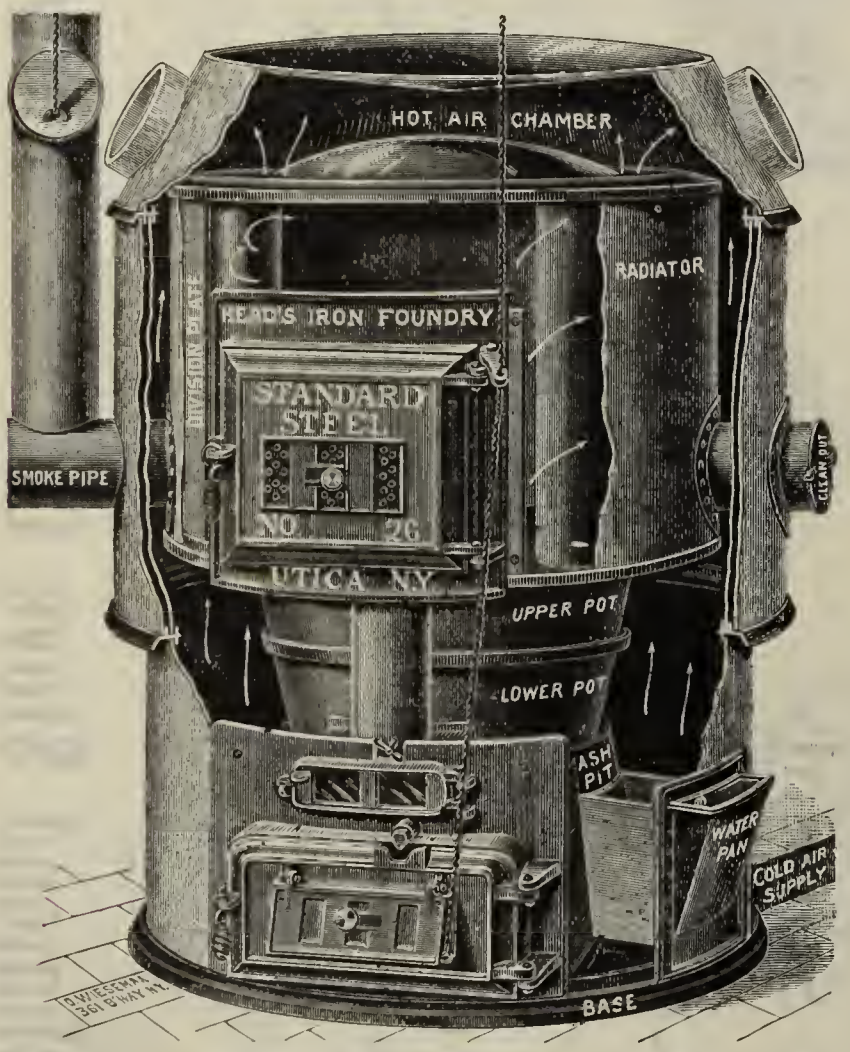
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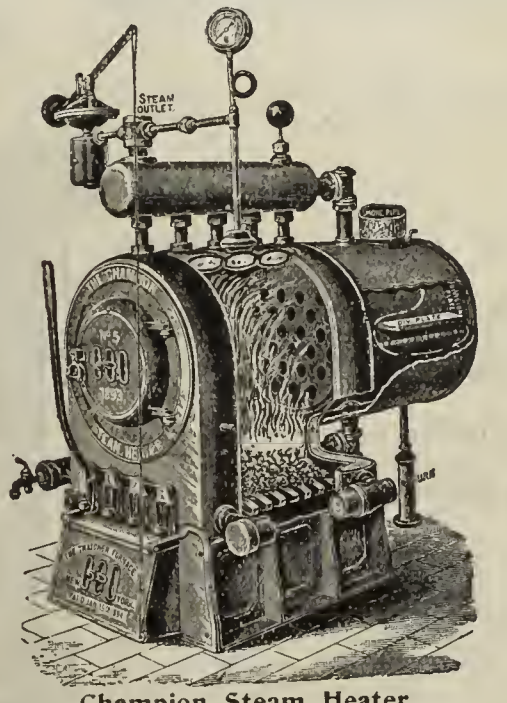
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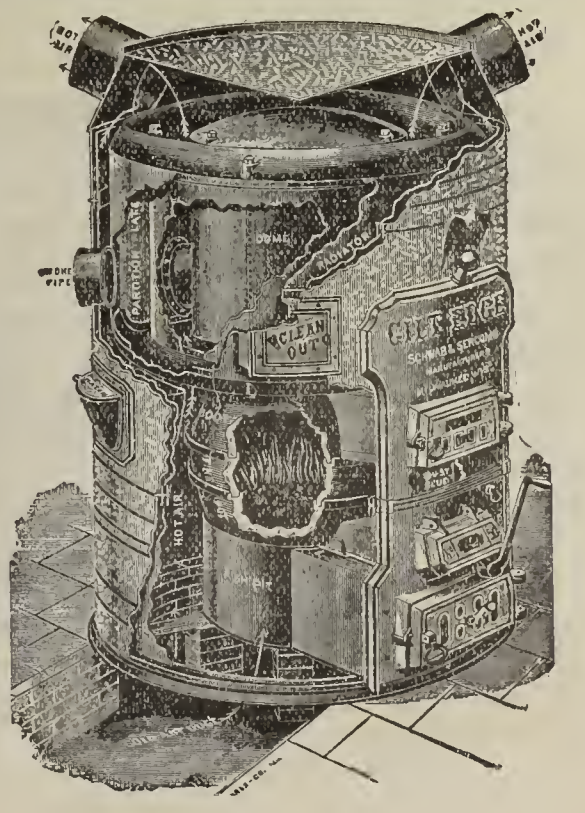
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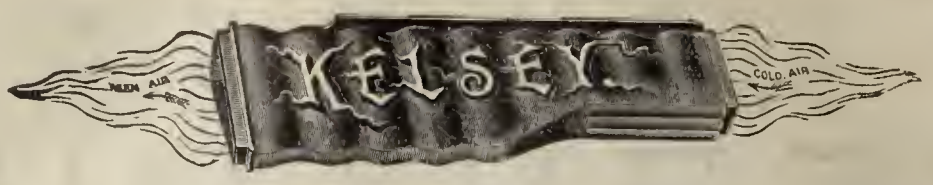
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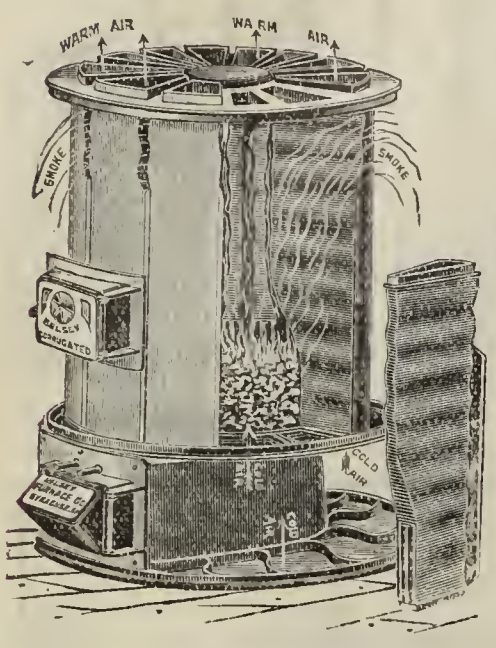
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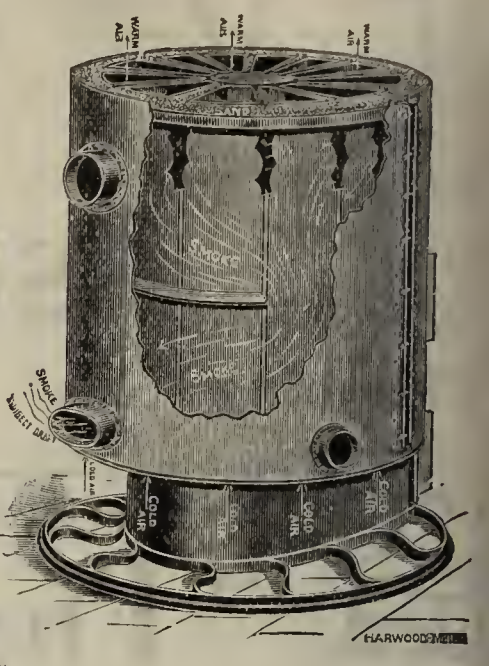


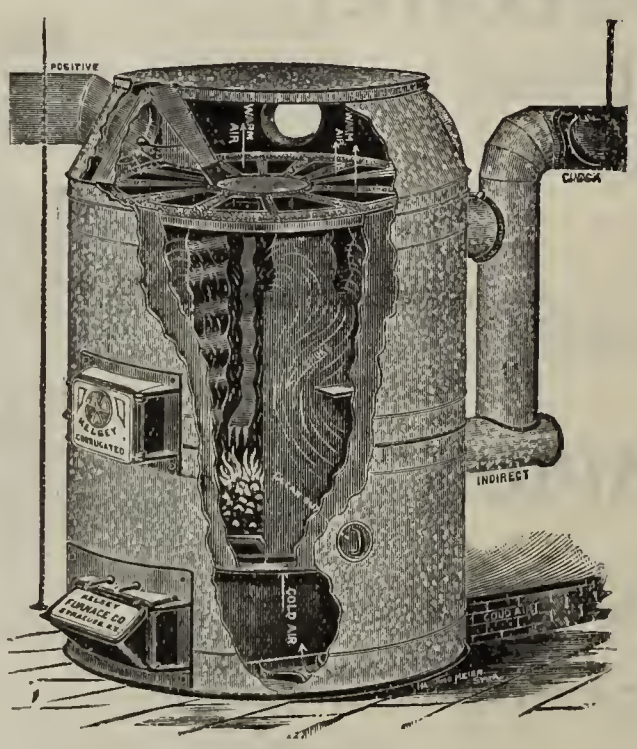


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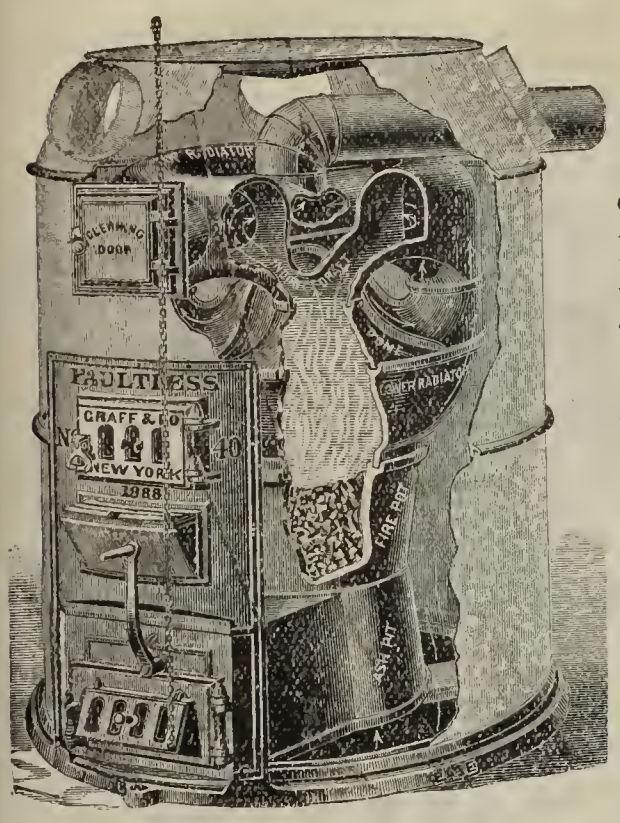
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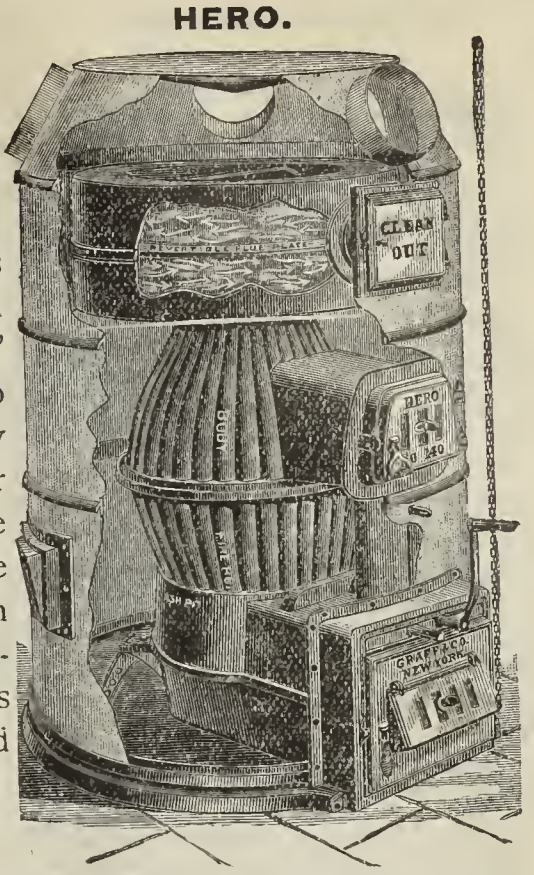
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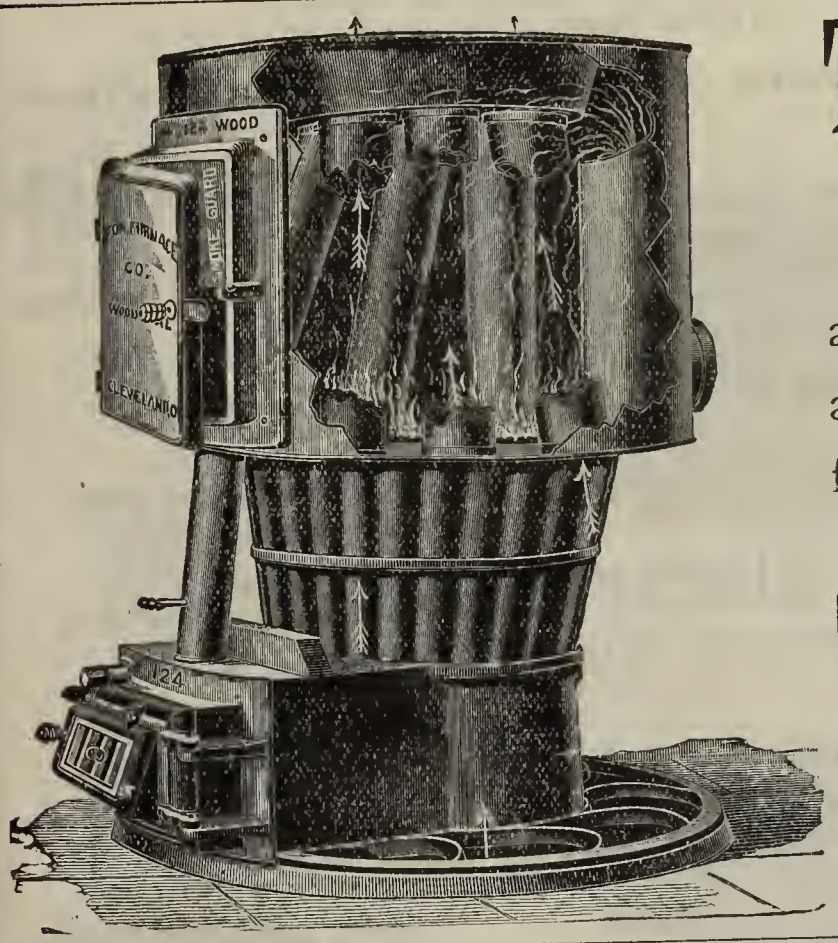
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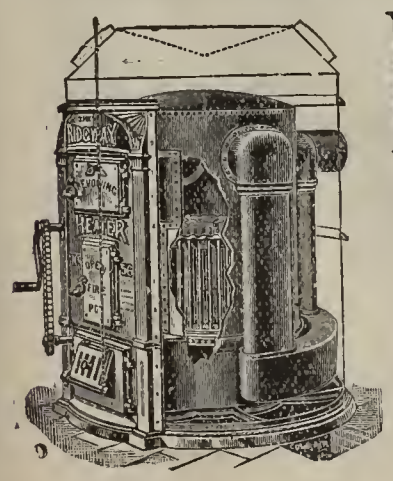
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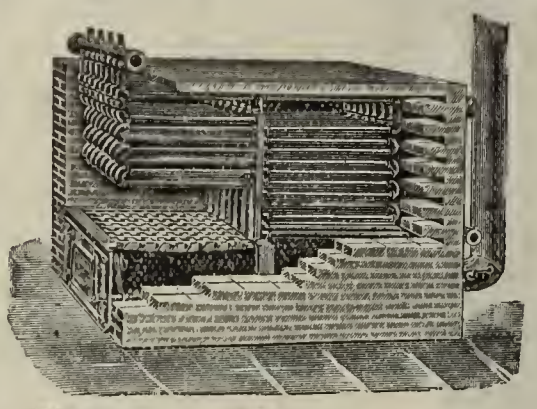
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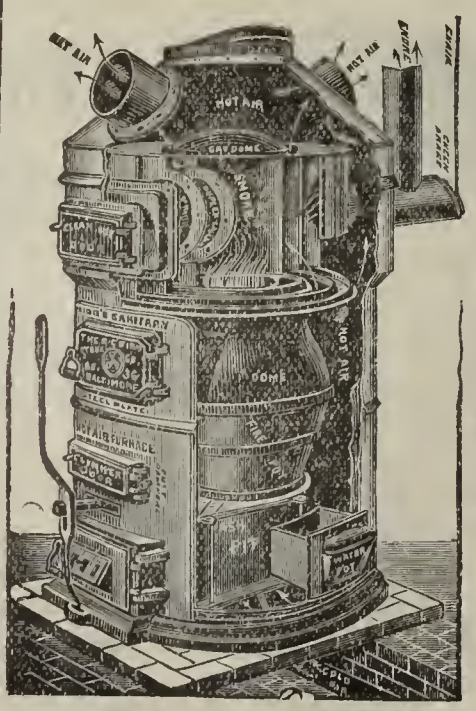
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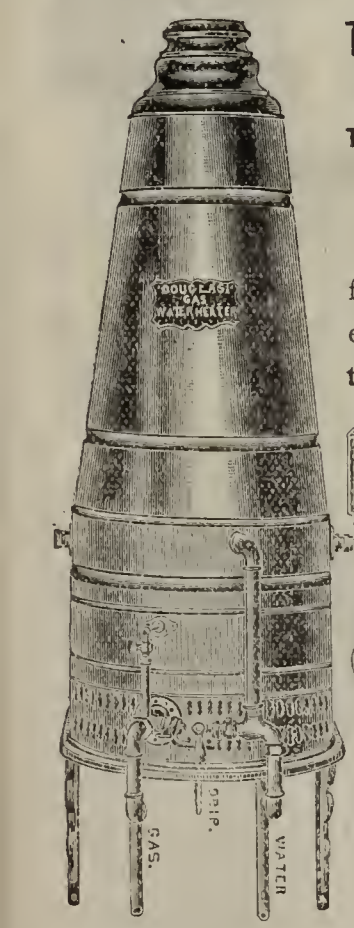
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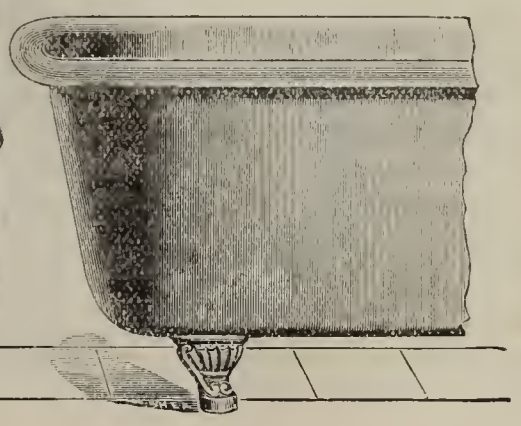
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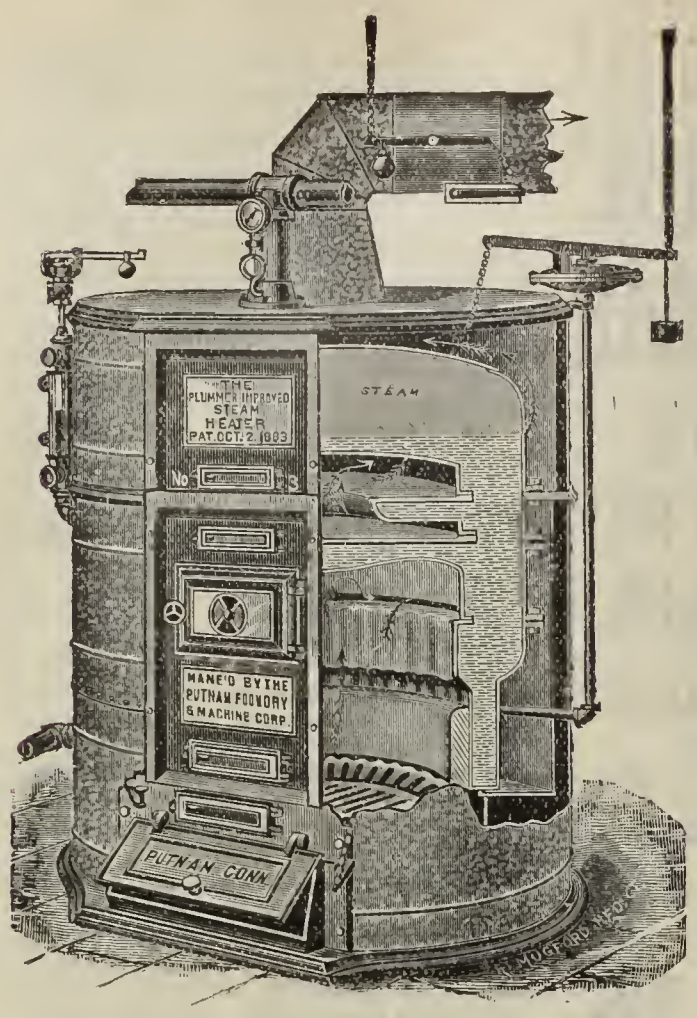
Distribution of Cold.

The following account of long-distance refrigerating is extracted from an article in the *Cosmopolitan* by S. E. Tillman: The distribution of light, heat, water, power, and even human speech from a central station, has been an accomplished fact so long that it attracts no attention. The artificial production of cold, as illustrated in various chemical and domestic operations and in ice factories, is also a familiar process; but the successful distribution of cold from a central station is so recent as to be known only to a few. This is now accomplished over large areas. Cold is but the absence of heat; it is, therefore, only necessary to cause the heat in any space to disappear to produce a low temperature, or cold. The removal of heat must, then, be the principle involved in all refrigeration. The production of cold at widely different places from a central station, accordingly, does not differ in principle from its production in an ice factory. While this is true, the engineering difficulties in the pipe line distribution of cold from a central station were very great. It has been unsuccessfully attempted at various places, including London, New York, Boston and Paris, but is now in successful operation in Denver and St. Louis.

In these plants the agent for producing cold is liquid ammonia. This substance is liquified at the central station and transmitted through iron pipes, under a pressure of 150 pounds to the square inch, to the places to be cooled. At these places the liquid ammonia flows through an adjustable opening in a small valve into one end of an expansion or cooling coil. The other end of this coil is connected with a return pipe leading back to the station. The boiling point of liquid ammonia under atmospheric pressure is about 30° below zero, so that any temperature above this will boil it away very rapidly. This boiling away or evaporation of the liquid ammonia in the expansion coil cools the surrounding space and the temperature desired is obtained by regulating the rate at which the ammonia escapes from the main. A constant suction is kept up in the return pipes, so that the vapor of ammonia returns to the central station for repeated use. In this process a liquid fills the outgoing pipes and vapor the return pipes, which is just the reverse of the steam heating process, where vapor fills the outgoing pipes and liquid flows in the return pipes. In steam heating from a central station there is much loss by radiation from the mains; in the refrigerating process there is no corresponding loss, as the liquid ammonia is passed through the mains at ordinary temperatures.

The system described admits of many applications, the most ordinary and important of which at present are the cooling of storage boxes for hotels, restaurants, saloons, butchers and butter houses and in enabling hotels and *cafés* to make their own ice; in cooling water for large stores and factories, and in cooling soda water fountains. Among the luxurious applications may be mentioned the cooling of summer *cafés* and dining rooms to any desired temperature In St. Louis 10° to 15° between the inside and outside temperatures were found most satisfactory. For this room cooling the same pipes used as a cooling coil in summer are used as a steam radiator in winter.

The area that can be supplied with cold from a single station is about the same as can be supplied with illuminating gas. This new industry can never become as general as those mentioned in the beginning of this note, for "keeping cool" is in many cases a luxury rather than a necessity.



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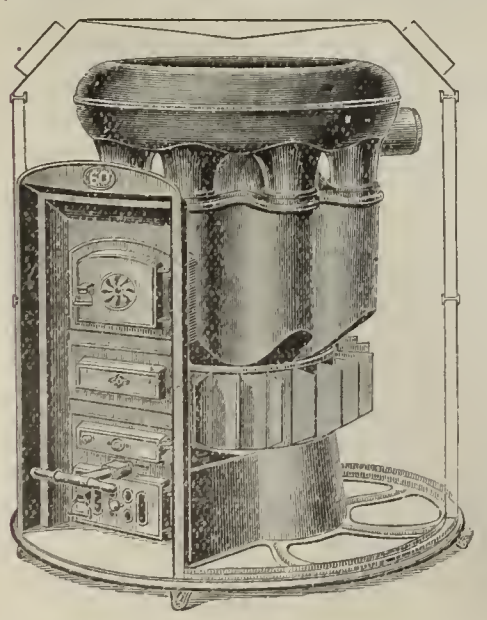


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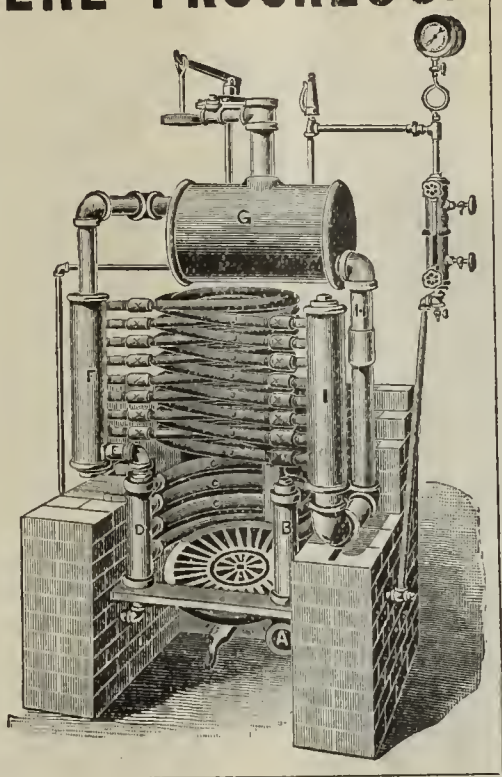
Established 1847.

— APPOINTING TELLERS IN CONGRESS.—Every time tellers are appointed in the House there is an interesting sight. A member on each side of the question under dispute takes his stand in front of the Speaker's desk and the members file between the two men and record their votes. There are two men who do not do this. They are Stone of Kentucky and Sickles of New York. Each of them lost a leg in the war and is obliged to use a crutch at all times. Whenever a vote is taken by tellers some member near one of them finds out how he wishes to vote, then takes his crutch and marches with it down to the front, passing between the tellers. The vote is recorded and the crutch is taken back to its owner again.—*The Press.*

— WITH microbes in water, consumption in milk, and poison in whisky, it bothers a man to know what is best to drink.—*Exchange.*

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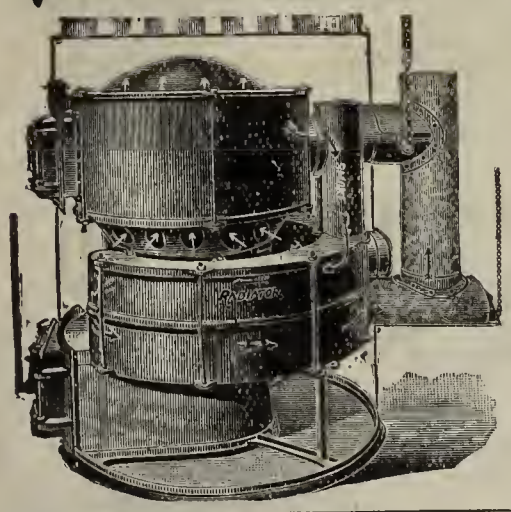
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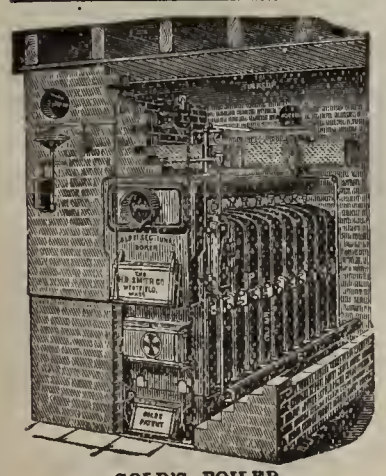
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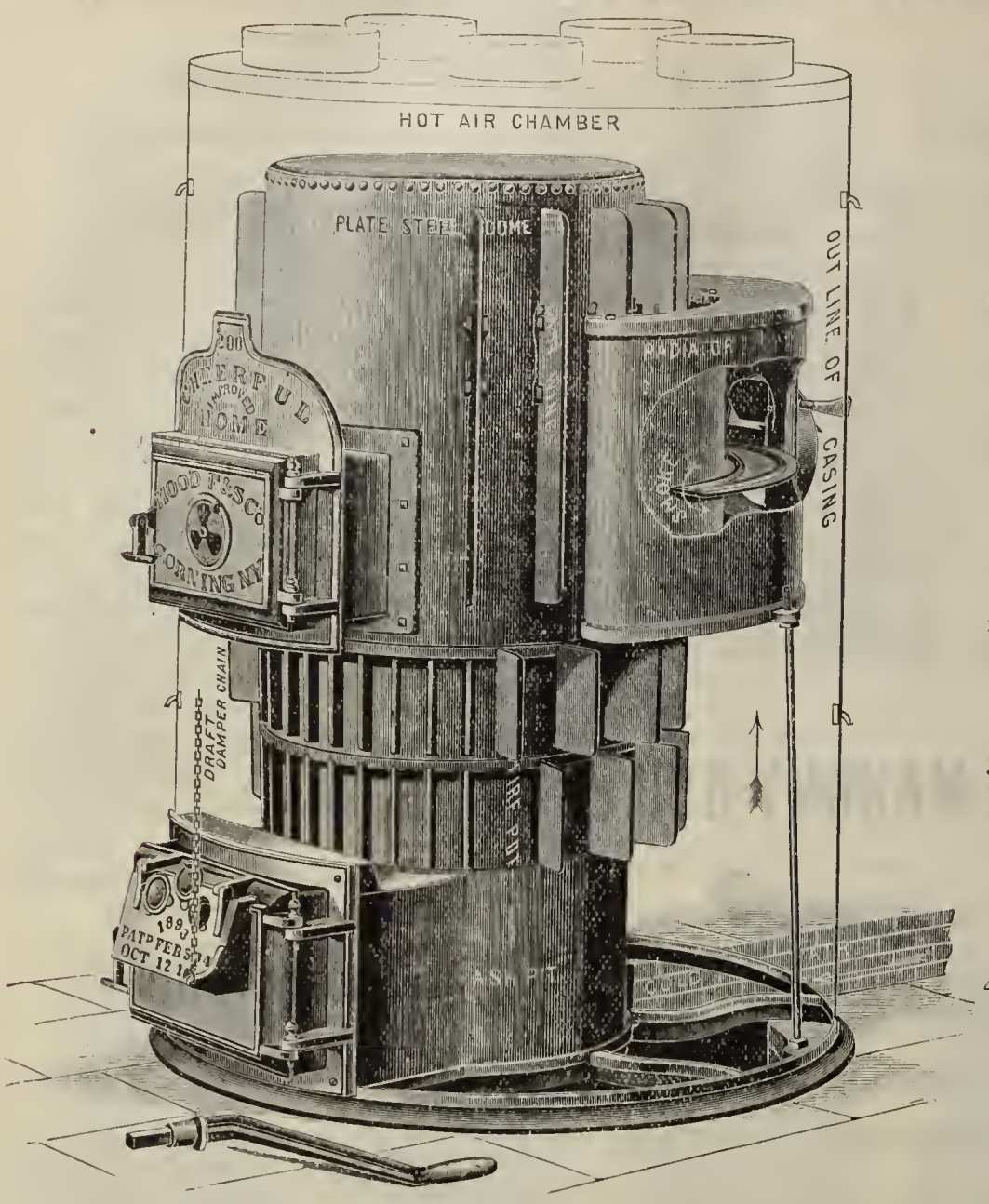
Introduction.—Utility of Ventilation.
History and Literature of Ventilation.
The Atmosphere: Its Chemical and Physical Properties.
Carbonic Acid.
Conditions Which Make Ventilation Desirable or Necessary. Physiology of Respiration. Gaseous and Particulate Impurities of Air. Sewer Air. Soil Air. Dangerous Gases and Dusts in Particular. Occupations or Processes of Manufacture. Drying Rooms.
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Quantity of Air Required for Ventilation.
On the Forces Concerned in Ventilation.
Examination and Testing of Ventilation.
Methods of Heating. Stoves. Furnaces. Fireplaces. Steam and Hot Water. Thermostats.
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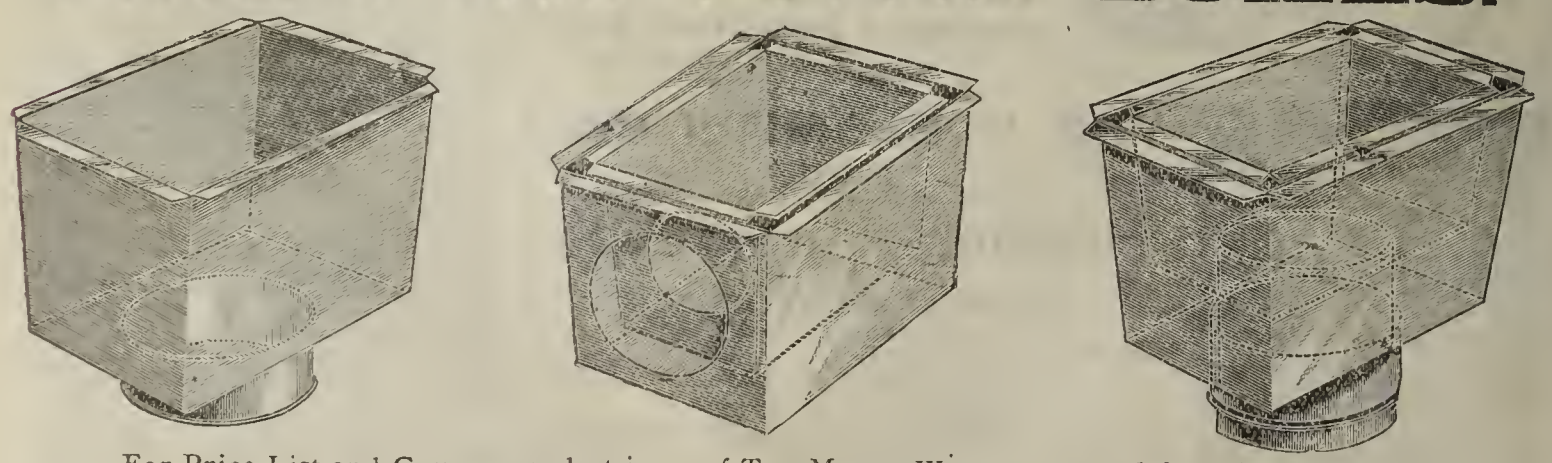
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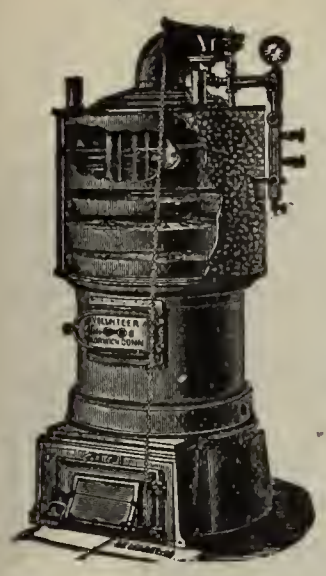


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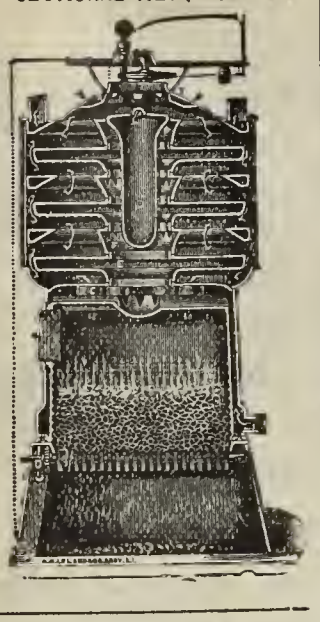
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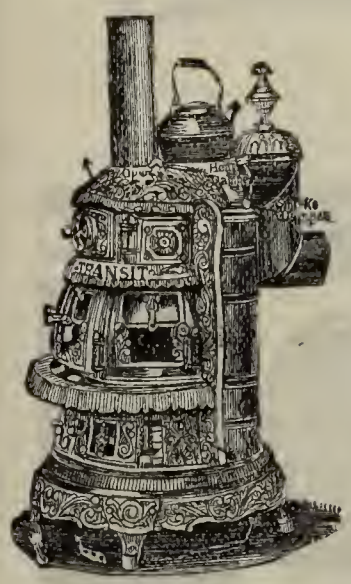
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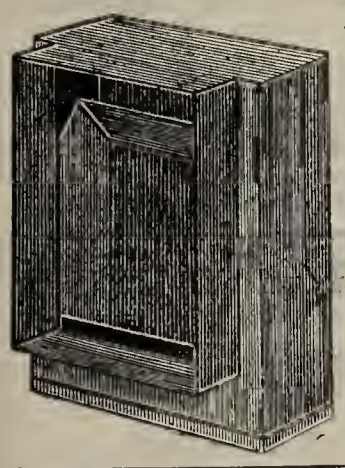


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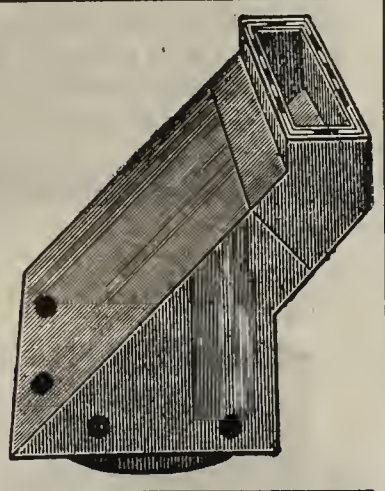
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A Sanitary Building.

The *Popular Science Monthly* gives an interesting account of a curiously constructed building designed and erected by Dr. W. Van der Hayden of Yokohama, Japan, for his own use. In this building the doctor seeks in winter to imprison the heat rays of the sun, and in summer to admit the light while excluding the excess of heat. At the same time the edifice affords, it is said, perfect ventilation and security against disease germs. In a word, it is a "sanitary" dwelling, if not an entirely attractive or convenient one. The walls of the house, we are told, are made of air tight boxes, with sides formed of panes of glass, built one upon another, hermetically joined with felt and filled with a solution of alum. The roof is covered with cement. At convenient intervals in the walls of rough plate glass are plates of polished glass, to be used as windows for looking out.

A house built in such a way, says the publication referred to, is an entirely closed hollow space, like a box itself, without windows or doors—no openings and no fissures. It is practically impermeable to air, moisture or heat, cold, dust, microbes and insects. Doors are not wanted, because the entrance can be made through the floor by means of a lift or staircase from an underground room which receives no direct light from the sun. The walls of the underground room are made of ordinary bricks, plastered inside, and protected outside with a thick layer of clay to keep out moisture; it will be better to have these walls constructed with iron plates, as quick conduction of heat is the requisite here. The light for this room comes through glass boxes let in the four corners of its ceiling, which forms the floor of the upper room. There is a nice mild diffused light in the lower room which fully enables one to do any laboratory work, and is sufficient to read by.

The walls are protected against freezing in winter by inclosing the whole building in a covering of window glass. In the summer the window glass frames are put within the house, and furnish air cushions, still further preventing the accession of outside heat. Special arrangements are made for the renewal of air, heated in winter and sterilized at all times; and as the house is proof against the entrance of air from any other source, all microbes, disease germs, infections and insects are efficiently kept out. The designer, we learn, has tried his unique house and thinks well of it. People, however, have a rooted prejudice in favor of doors and windows in their places of abode, and it would take some persuasion to convince them that coming up through the floor was the most desirable mode of entering a room.

— A JURYMAN'S NEAT EXCUSE.—Lord Hannen, the distinguished English judge, was never known to be hoaxed but on one occasion. A juryman dressed in deep mourning, serious and downcast in expression, stood up and claimed exemption from service on that day, as he was deeply interested in a funeral of a gentleman at which it was his desire to be present.

"Oh, certainly," was the courteous reply of the judge, and the sad man went.

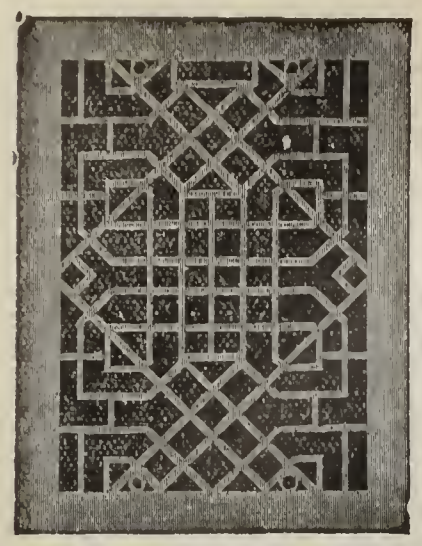
"My lord," interposed the clerk, as soon as the ex-juryman had gone, "do you know who that man is that you exempted?"

"No."

"He is an undertaker."—*San Francisco Argonaut.*

— CUSTOMER: "That's a queer shaped piece of pie. Looks something like a turnover."

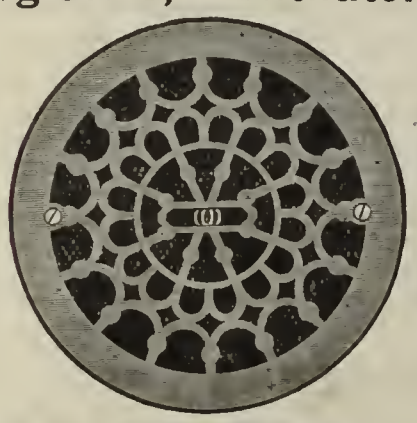
Waiter: "No, sir; it's a left-over."—*Exchange.*



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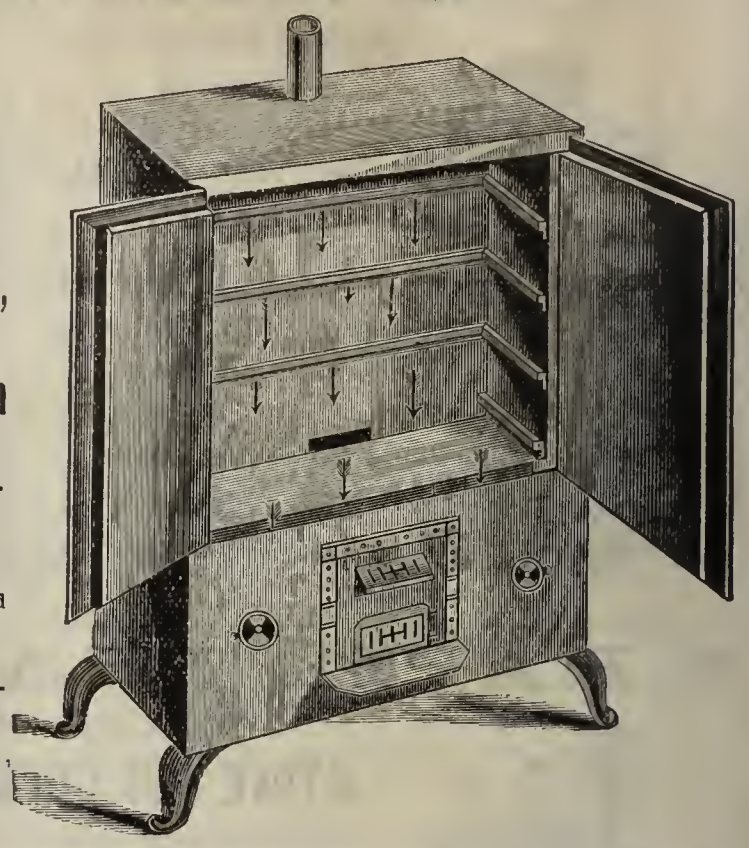
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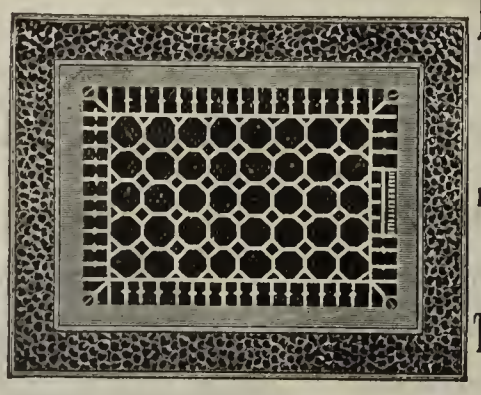
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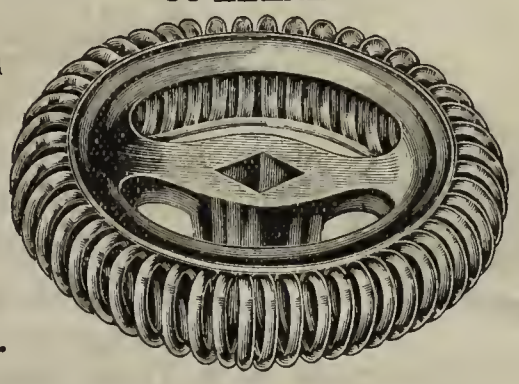
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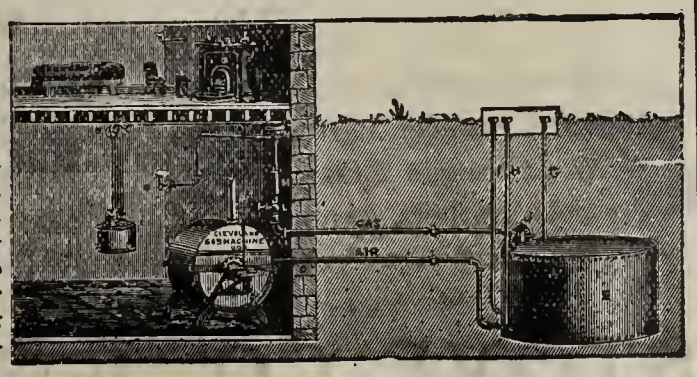
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This is woman's age, and a business man who knows says there is positively nothing that she will not undertake. He was lounging in his office one day when the door opened and a well dressed, comely little woman appeared. She wore a resolute expression in addition to other apparel, and in her hand she carried a large tack raiser.

"Good morning," she said winningly, "Is this Mr. Cash's office? Will you please tell me which chair it is that has the nail in it?"

The business man was confused—the nice little woman was a total stranger to him. He answered wildly, "What chair? What nail?"

"Why," she explained, "my husband has come home three times recently with dreadful holes in his coat and trousers, and he said he tore them on a chair in your office. I'm about tired darning and patching those rents and thought it would be more sensible and satisfactory to come down here, pull the nail out and be done with it. Don't you think so?"

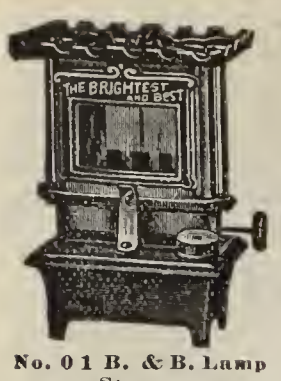
Still in a trance, the merchant agreed with her, found the offending chair, extracted the nail, and with many thanks and smiles the enterprising little woman withdrew.—*New York World.*

Scopæ Exercise for Girls.

Young women in search of physical culture are respectfully referred to the following rule, laid down by Mrs. Brigit Maguire of New York, says the *National Standard*:

"Take the scopæ in the hands, which should be held at half reach reversed grasp, allowing the bushy portion of the scopæ to rest upon the floor, and holding firmly to the upper end of the handle. Bend the body slightly forward, give the arms a horizontal movement, lift the scopæ slightly, and move the one foot before the other. Repeat these movements until the scopæ has been brought in contact with every portion of the floor."

P. S.—Scopæ is Latin for broom.



No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8⅛ inches. Size of Tank, 3⅛x5⅛ inches. NICKEL FRONT. Four-inch wick.

Dealers who Handle B. & B. STOVES

Make Money at Both Ends.

There are no old relics or fossils in the B. & B. line.

B. & B. STOVES ARE ALWAYS AHEAD.

Our competitors try to imitate, but the race is too rapid for them.



No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozen in box. Weight, 85 pounds. Height, 8⅛ inches. Size of Tank, 5⅛x5¾. NICKEL FRONT. Two 4-inch wicks.



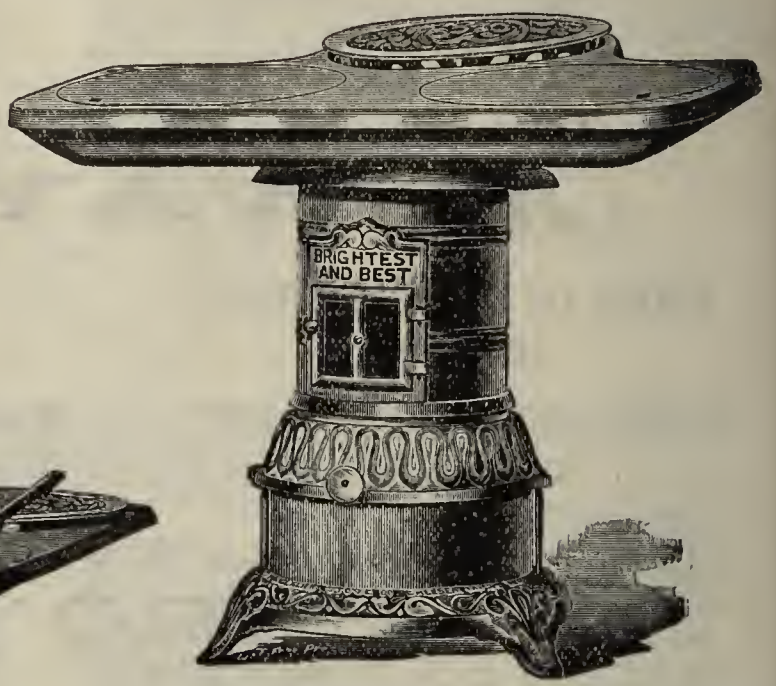
No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozen. Code word, *Gauge*. Packed ⅙ dozen in box. Weight, 85 pounds. Height, 8⅛ inches. Size of Tank, 5⅛ x 8⅛ inches. NICKEL FRONT. Three 4-inch wicks.



No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.



No. 6–3 B. & B. Cook Stove.

Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.



No. 8. B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. 7¼ inch double thick circular wick.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**

It will pay you to consider these points.

We Are After Your Trade.

You will always find the B. & B. Stoves up to date in every particular.

You cannot spend a little time more profitably than in looking over our 80-page catalogue. Ask for one, with discounts.

Simmons Hardware Co., St. Louis,	General	Southwestern Agents.
Hibbard, Spencer, Bartlett & Co., Chicago,	"	Northwestern "
W. W. Montague & Co., San Francisco,	"	Pacific Coast "
Prescott Brothers, Boston,	"	New England "
Bindley Hardware Co., Pittsburgh,	"	Eastern "

THE GLAZIER STOVE CO., Manufacturers, CHELSEA, MICH.

THE METAL WORKER.

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Self Reliance.

No man was ever truly great who was not self reliant. The very exercise of this virtue sets the man apart from his fellows in the walks of life, makes of him a thinking being who decides for himself and acts for himself. His deeds bespeak his inner thoughts; they do not merely reflect the ideas of others. No matter how far down in the scale we go, still we find the man who relies first upon himself, creates for himself a distinct individuality, is the man who gradually climbs above his fellows and his surroundings. Daily and hourly the mechanic is called upon to display that ability of his order that should enable him to do his work rapidly and well without the help of others. Not that such an individual should become egotistical, but that he should so consider and apply that which he has read and heard that at the moment of application he need not run to others for suggestions. It is a matter of thinking and deciding for himself, and each time he does it his future ability is increased, his self reliance strengthened. Every foreman or superintendent soon reads the character of his men. Some in the spirit of sincere interest will ask deep and searching questions as to why and wherefore; others are soon marked by their habit of continued questioning apparently because it is easier to ask than to think. To this latter class there will, as a consequence, be given little of the work requiring forethought and judgment; in fact, the very opportunity of exercising such self reliance as they may possess will be removed, while the men to whom such tasks are given will be continually educated and elevated.

Cultivating Self Reliance.

While heredity may have somewhat to do with a man's abilityto think and act for himself, nevertheless no man can be excused, for it is a virtue that can be trained. The good work must begin at home; the man must first learn to control himself before he can expect to exercise his ability over or among others. It is related of "Stonewall" Jackson that his wonderful success was due to his continued exercise of self control and self denial, and that thus "he had conquered himself and was thus made fit to be a conqueror." So the mechanic who first determines to conquer himself, who resolves never to ask a question until he has first endeavored to answer it himself, who willingly hears the opinions of others, but carefully forms his own, will gradually but certainly change his character and make his actions more and more independent of those of others. The self reliant mechanic can never be merely imitative; he must, in the broad sense, be creative, inventive. Even if he has a thousand times seen a thing done in a certain way it is no reason why he should not seek a better if that already known is not satisfactory. To almost every mechanic comes constantly the necessity of determining some way of accomplishing a result which he has never seen before. It is so easy to fall into an abstract way of thinking of such matters, feeling that like a sermon they apply to some one else, that the ordinary man fails to profit by their consideration. Let him rather test the advice in his next day's work. Let him determine that what he does shall be done by right of his ability to accomplish it; that he will command confidence by his self reliance; that he will seek rather than avoid opportunities to assume responsibility. The change will not come in a day, but come it will, and as the months and years roll by he will find himself, and, better still, others will discover him, to be a thinking, a self denying, a self controlling, a self reliant man.

Features of the Coal Strike.

The coal miners' strike is ending in about the usual way. Some districts have been able to secure the advance for which they contended, others got no advance and some figure out an actual reduction. The national leaders have lost their prestige and in those districts in which no substantial advantage has been gained it would hardly be safe for them to put in an appearance. For nearly two months the miners and their families have endured pitiful privations and now find themselves too often burdened with an indebtedness which will require months of the most pinching economy to discharge. Meanwhile their reflections must be bitter against the foolish leaders who ordered the unions under their control to strike. But particularly bitter must the reflections be of those miners who had no personal grievances and merely struck through sympathy, in the belief that a general suspension of coal mining would end the strike very quickly. They were greatly deceived in their estimate of the stocks of coal above ground and the supply available from mines not yet under control of the unions. Coal consumers themselves have doubtless been surprised to find that so long a strike could be experienced without much more serious results occurring from the scarcity of fuel.

Lesson of the Strike.

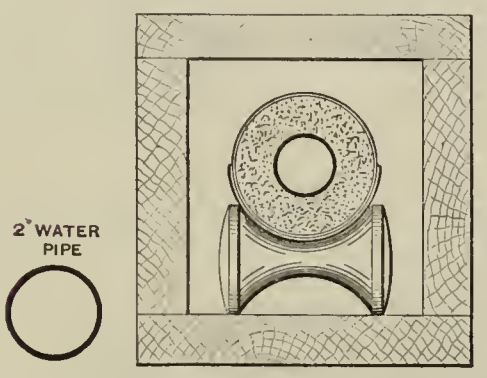
A lesson of this strike, therefore, and one which should be taken to heart at this time by other workingmen in danger of being beguiled by seductive agitators, is the very long time needed to make the strike felt by any considerable proportion of the public. A stoppage of the mines for a week or two was expected to check all business and create a formidable sentiment in favor of the quickest means to settle the strike. Such a short suspension of work was a holiday, and the miners threw down their picks with alarcity. Had they known that nearly two months would be permitted to pass without a general wail of distress from consumers, it may be doubted whether they would so cheerfully have courted the uncertainties of a strike. No matter how necessary their product may be, the workingmen in any line will find a period of business depression a poor time for entering upon a strike with any expectation of gaining substantial benefit.

The City Council of Philadelphia have just passed an excellent ordinance in relation to the removal of kitchen and other garbage. It directs that housekeepers shall use only metal receptacles, water tight and covered, for the garbage, which will be removed by the contractors in metal, water tight and covered carts. Heretofore the practice of householders there, as in New York and Brooklyn, was to place all kinds of open vessels and receptacles full of garbage on the sidewalks to await removal, regardless of their being offensive to sight and smell, and that the wind frequently blew the lighter kind of refuse into the neighboring properties, conveying, perhaps, some disease with it. The order provides that householders or contractors failing to observe the new regulations will be subject to arrest and a fine. This sensible proceeding might be followed with advantage by the municipal authorities in other cities where the unsanitary practice of leaving uncovered refuse pails on the sidewalks for hours still prevails.

THE LETTER BOX.

Long Line Piping for Steam Pump.

From FOUNDRYMAN, *Tennessee.*—We wish to run a steam pipe from our boiler to a pump located near a creek, to force water into a tank on top of a tower 50 feet high. The boiler is 700 feet from the pump and the steam pipe is to be run under ground. The pump is located on the side of a hill. It is 50 feet from the top of hill to creek and the pump is 20 feet from top of hill, but is sunk into a pit, leaving it about 15 feet above water level. From boiler to top of hill (680 feet) the steam pipe will run on about a level. The boiler is 40 horse-power and is run at 60 to 80 pounds pressure. The pump is a Deane pressure pump. The diameter of steam cylinder is 7 inches; diameter of water cylinder, 4¼ inches; stroke, 8 inches, and capacity 120 strokes per minute or 58 gallons per minute. Size of steam pipe, 1 inch; size of steam exhaust pipe, 1½ inches; size of suction, 3 inches; size of discharge, 2 inches. What we wish to know is whether a steam pipe can be run from the boiler to the pump so that it will work successfully; what size steam pipe it will require; how should steam pipe be protected under ground from freezing, &c.; how should the pipe be drained, and what provision should be made for expansion and contraction?



Long Line Piping for Steam Pump.—Fig. 1.—Section through Box and Steam and Water Pipes.

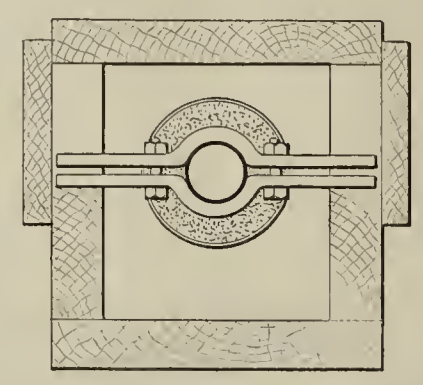


Fig. 2.—Section Showing Clamp.

Answer.—The question of size of pipe for the duty and friction of pumping for water and the friction and condensation of steam require some consideration. With a 2-inch discharge pipe carrying 50 gallons per minute, the friction head for 700 feet of pipe with the necessary elbows will be 20 pounds per square inch or 46 feet in addition to the total hight from the creek to the tank, which, as we interpret the meaning of our correspondent, may make a total of 146 feet head to be pumped against. This is equal to 63 pounds per square inch pressure on the pump piston. As the steam cylinder is two and three-quarter times the area of the water cylinder, then $\frac{63}{2.75} = 23$ pounds, the actual steam pressure required upon the steam piston per square inch to balance the pump pressure. To this should be added 50 per cent. for pump friction under the required speed, say 35 pounds pressure at the pump.

The steam cylinder at 100 strokes per minute will require 18 cubic feet of steam per minute at 35 pounds pressure, or 10½ cubic feet at 60 pounds pressure, the lowest normal pressure at the boiler. This would involve a loss of 35 pounds pressure by friction and condensation if 1-inch pipe is used, so that the next size larger, or 1¼ inch, is the smallest that should be used, which will involve a friction loss of 21 pounds, making the pressure at the pump 39 pounds or sufficient for its work.

The expansion of the steam pipe should be provided for for a length of 650 feet, say from the point of entering the ground to the brow of the hill. For this purpose a hard brass slip joint made for a run of 14 inches should be inserted as near the middle of the line as convenient in a bricked up chamber with cover large enough for convenience in packing the joint. A strong clamp and anchorage at each end of the straight pipe line will divide the expansion so that the travel at the expansion joint will be as short as possible on either line, and which is found to be more satisfactory than to have the expansion move all in one way, in which case the slip joint could be placed in the boiler room. For the protection of the pipe not less than 1-inch felting of hair, or, better, magnesia felting, should be put on the pipe throughout its whole length from boiler to pump. At places from 12 to 15 feet apart a piece of galvanized sheet iron should be wired on the under side of the felting long enough to ride on a light cast iron spool, with the neck curved to fit the outside of the felting and sheet iron so that the spool will keep in its proper traversing position.

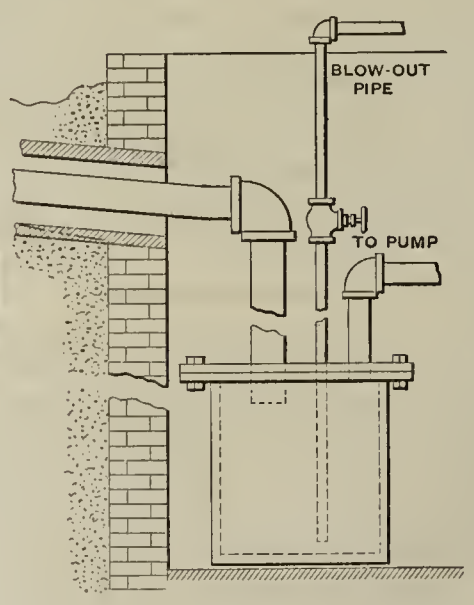


Fig. 3.—Separator Connection.

Outside of all should be made a box of pine, or, better, oak, wide and high enough to clear the felting by 1 inch all around, as shown in the cut, Fig. 1. The clamps, Fig. 2, should be made of ⅜ x 2 inch iron, 8½ inches long, let into the box between two sections, and a strip nailed over the slot to close the opening. One foot earth covering is sufficient for the climate where our correspondent is located. The steam pipe at the pump pit should drop into a cast iron separator of about 1 cubic foot capacity, which may be made of any convenient pattern, as a pot, with bolted cover, strong enough for the highest steam pressure in the boiler; with the pipe connections as illustrated in Fig. 3, or a piece of 6 or 8 inch pipe, 2 to 3 feet long, with caps, set on end and connected with the steam pump and waste pipe, carrying out the principles illustrated in Fig. 3, may be used. An ordinary float steam trap, such as used in the steam heating trade, which is automatic in operation, may also be used for a separator, the pump pipe being tapped through the cover away from the inlet. One-inch pipe and valve is large enough for the pump steam connection. After a few trials our correspondent will learn how often to blow off the waste trap if the plain box is used. The water pipe need be laid no deeper than the bottom of the box and in the same trench, as in Fig. 1. The warmth of the box will protect it from freezing. An air chamber on both suction and force pipe is required, possibly furnished with the pump. A large fine meshed strainer and foot valve at the lower end of the suction pipe, well

protected from flood and ice, with good judgment in making all the pipe work tight and the examination of every piece of pipe for obstruction previous to putting in place, will, we think, make our correspondent's pumping plant a success from the start.

Wants a Better System.

From T. H H., *Harrisburg, Pa.*—I notice in *The Metal Worker* of May 12 the letter of "W. S. G." of Penbrook, Pa., condemning the system of heating and ventilating a church in course of erection there. Now I would like to say for his benefit and those who have been commenting upon the matter that his statements are not in any sense facts. The statements were made partly through ignorance of the intent of the plans and, I think, partly intentional. His diagram showing the location of the registers is only in part correct. He then goes on to say that I intend to drive the stagnant air out of the room through the stack, which is as cold as Greenland. He, of course, did not know that this was to be warmed by the smoke flue, which will undoubtedly cause upward currents. The next misstatement he makes is that I intend to get my fresh air from the cellar. If he had taken the pains to have read the carpenter's specifications he would find that the carpenter has been directed to put in cold air ducts at the proper time, as may be directed. He then says that if the furnace were put in according to the plan the result would be a warm ceiling and a cold floor, also great loss of heat through friction and radiation in the cellar. I have recommended that the pipes be wrapped with asbestos paper, thereby reducing the loss from radiation to a trifle. The next barrier to perfection in the system, he claims, is that the chimney is lower than the roof. Now the top of the chimney is 20 inches lower than the comb of the roof and stands 18 feet away, with no other obstruction near. Now if "W. S. G." will insist that a stack as high as that one, and located as it is, will have down currents he only displays his ignorance. I have had some experience with his plan of pouring hot air into a room in an undivided volume, and I have found that those sitting near that volume roasted, while those around the outside of the room froze. Therefore I claim that distributing the heating registers is superior to bringing in the hot air in one volume and forcing it to all parts of the room. Especially is this true when there are heavy air currents on the outside. "W. S. G." should learn all the facts in a case before coming before the public and roasting any one, as one of the correspondents puts it, who through ignorance recommends anything that will be detrimental to health and comfort.

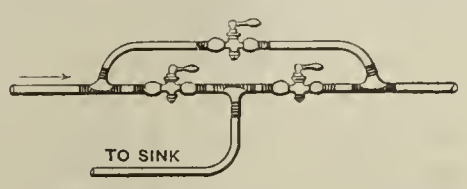
Wants Statistics on Brick Set Furnaces.

From CÆSAR, *Louisville.*—I noticed a short time ago, cannot say just where, a statement that brick set furnaces were passing out of date. Can *The Metal Worker* or its readers give about the difference in number that were put up ten years ago and in what proportion they are being placed at present? I would like to hear from some good brother of the craft why this decline, and why the portable is favored. There are several good reasons for it that can be proven to any practical furnaceman. This is a very important matter to the craft generally and a general discussion of it will prove beneficial.

What Is a By-Pass?

From E. O. H., *Melrose, Mass.*—I saw in *The Metal Worker*, May 5, the letter of "A. J C.," asking "What is a by-pass?" The answer seems plain enough, but I cannot think of any possible circumstance where such an arrangement would be necessary, consequently I thought I did not understand the answer. I send two sketches of by-passes, Fig. 1 showing the by-pass described in the answer, and I would ask why is Fig. 2 not a by-pass?

Answer.—A by-pass is virtually another way to a given point, and it is possible that our description of its use has misled our correspondent. If a water meter or water motor was placed on the pipe at the point where the branch is taken off in Fig. 1, by opening the cock in the by-pass, water could pass beyond it and supply the main when



What is a By-Pass?—Fig. 1.—Showing a By-Pass.

the meter or motor was disconnected for any cause and the other cocks closed. In the use of valves on large street mains with a heavy pressure a by-pass is frequently used in order to open them by letting water in the main beyond the valve to equalize the pressure on both sides of the valve gate. Otherwise a pressure of 60 pounds to the square inch on a 48-inch valve would find the gate withstanding a pressure of over 100,000 pounds and without the aid of a by pass to equalize the pressure the opening of the valve would be a difficult matter. From this description

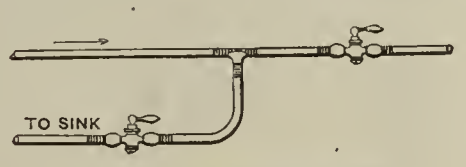
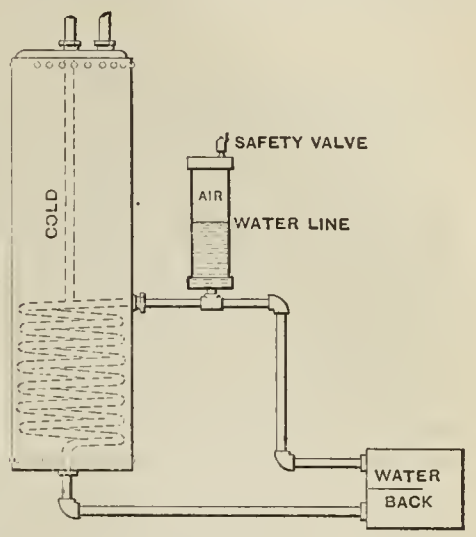


Fig. 2.—A Suggested By-Pass.

of the use of a by-pass our correspondent can readily see why Fig. 2 is not adapted to serve as one. Another character of by-pass is shown and described in the letter of "Oliver Twist," in *The Metal Worker*, June 9.

Choked Water Backs.

From P., *Paterson, N. J.*—Having noticed the letters of "E. J. Y." and "Swiped Joint" in the Letter Box, May 19 and June 2, I can say that the latter's suggestion of running a pipe through the boiler is feasible. There should be 1 square foot of surface exposed in the pipe for every 5 gallons of water in the boiler to insure the water being heated. A pipe running down through the boiler would not be enough. Boilers for heating the water by steam are made with coils of proper proportion in them. With such a boiler it would only be necessary to use a closed expansion tank attached to the pipe from the water back. This tank is simply an air chamber and should not be entirely filled, and should have a safety valve at the top, as shown by the



Choked Water Backs.

sketch. If it was made of 3-inch pipe, 18 inches long, and connected to the piping it would be ample. The pressure under which the circulation would take place would depend upon how much the air was compressed by the expansion of the water when it was heated. The water might be heated in the pressure system several degrees above the boiling point and would heat the water in the boiler faster in proportion to the increased temperature. If rain water or distilled water was used in the pressure system the water back or pipes would never become choked or reduced in capacity, and it is probable that there would not be sufficient deposit in the boiler or the cold supply or hot service to make trouble.

Miter Patterns.

From H. F. M., *Frankford, Pa.*—Will *The Metal Worker* kindly explain the method of obtaining the pattern for an ogee miter at other than right angles? I am aware that a miter line is employed, but do not understand its use, being only familiar with the short or usual method of obtaining the pattern for a square miter where the miter line is not used.

Answer.—As indicated by our correspondent, the pattern for a square return miter can be obtained from the profile, as shown in elevation. The pattern can also be obtained from the plan, a miter line being used in connection with the elevation. The latter method is usually employed for obtaining the patterns for a vase or urn having more than four sides, or for a return miter at other than right angles. If our correspondent desires a thorough understanding of the subject, he is referred to "The Metal Worker Pattern Book," pages 63 to 73, also to section 539 on page 153, and the accompanying figure on page 154.

Wants a Good Cement.

From R. P., *Huntsville, Texas.*—Will some of the readers of *The Metal Worker* please give a reliable recipe for fastening woolen cloth to tin or brass so that it will not peel off? I have a book on cements and glue, but find nothing satisfactory.

STOVE TRADE NOTES.

The Bryce Soft Coal Self Feeding Furnace.

The Bryce Furnace Company, 129 Huron street, Toledo, Ohio, have just published an illustrated catalogue of their furnaces and heaters. The catalogue, which is quite an artistic production, comprises 40 pages of very interesting reading matter on the subject of the Bryce self feeding furnace, which is specially designed for the use of soft coal. It is, however, equally adapted for hard coal or coke. Sectional cuts are printed to show the internal construction of this furnace and to explain the method of its operation. While the use of soft coal which cakes is to be avoided, the statement is made that all the other kinds of soft coal can be burned with good results, without the formation of smoke or soot, and with no more attention than is usually given to the operation of a hard coal base burner.

The magazine is of course immediately over the fire pot. The feed door is in the front of the furnace, high enough to deliver coal into the top of the magazine through a short chute. The magazine has a double shell to admit of the passage of gases and smoke from the top of the coal over the top of the interior shell down to the fire pot. After the fire is well started the draft is taken in at the magazine feed door, which then causes a down draft, consuming the gases and preventing the formation of smoke. Several styles of this furnace are shown. It is not only made for warm air but also for combination heating by warm air and hot water. The combination furnace has a water ring round the lower portion of the magazine immediately over the hottest part of the fire pot. These furnaces are furnished either in portable form or brick set.

The testimonials collected from users of the Bryce furnace scattered over a very large part of the West form a remarkably strong support of the claims made by the manufacturers that their furnace burns soft coal with economy and with very satisfactory results in heating. Agencies have been established at Columbus, Ohio; Buffalo, N. Y.; Minneapolis, Minn.; Goshen, Ind., and Iowa City, Iowa.

The Favorite Stove & Range Company

of Piqua, Ohio, and with branch at St. Paul, Minn., have issued a very handsome catalogue illustrating and describing the Favorite stoves and ranges, Favorite gas ranges and Favorite Piqua hollow ware. The binding is in embossed covers and the printing in black upon a fine quality of heavy calendered paper. Among the opening pages is a bird's eye view of the company's works and a steel engraving of W. K. Boal, president and founder of the company. The pages of the catalogue are of rather larger size than the majority of stove trade publications at the present time, and afford opportunity for the presentation of well executed engravings, accompanied by full descriptive particulars. The Favorite ranges occupy the first 40 pages, followed by the line of Birthday ranges, which are the same as the Favorite four-hole ranges, with the exception of the ornamentation. The Favorite cook stoves for 1894 for coal and wood comprise an interesting assortment of richly decorated constructions embodying the latest features. The line of Favorite gas ranges follows next, these goods being richly ornamented and offered in such variety as to meet all requirements. The heating stoves, led by the Favorite base burner, are treated in a comprehensive manner, and include the Carbon Favorite soft coal surface burner, Vesta Franklin, the West Point base burner, the Favorite base heater for wood, in which the application of the Todd stove principle is made to a cottage parlor; the Forest Favorite, Viola, Earl and Don. Several pages are given to the Favorite Piqua hollow ware and also to price-lists of stove trimmings, &c. An important announcement relative to the company's trade-mark as a means of advertising their entire line is printed in red on the last page. The catalogue considered as a whole is very attractive in its make up, and is a publication of which the company may justly be proud.

Consolidation of Vapor and Gas Stove Interests.

In the last issue we referred to the negotiations which have been in progress for some months past between Emerson McMillin & Co. of 40 Wall street, New York City, and certain of the vapor and gas stove concerns of the country, looking to the acquisition of these properties by the United Vapor & Gas Stove Company. Among the concerns interested is the Dangler Stove & Mfg. Company of Cleveland, Ohio, the president of which is David A. Dangler. In an interview the early part of the week with a representative of the Cleveland *Leader* Mr. Dangler is reported to have made the following statement respecting the movement in question :

"Under the circumstances I think it is time that the public should have a correct understanding of this consolidation of vapor and gas stove companies. It is true that the manufacturers in this line have perfected a combination of the following companies: The Quick Meal Vapor Stove Company of St. Louis, Johnson & Brandon of St. Louis, the George M. Clark Company of Chicago, the Baxter Stove Company of Mansfield, Ohio, and the Aurora Vapor Stove Company, the Schneider & Trenkamp Company, the Standard Lighting Company, and the Dangler Stove & Mfg. Company, all of Cleveland. We have already secured a certificate of incorporation under the laws of Illinois. We selected that State on account of its central location. The capital stock of the new company, which is called the United Vapor & Gas Stove Company, is $8,500,000. This amount is based upon the actual value of the franchises of the different companies, including real estate, other property, and some 150 fundamental patents which actually control the vapor interests of the world. The earnings of these companies last year would about pay 10 per cent. on the capital stock of $8,500,000."

"What is the object of this consolidation?"

"First, increased advantages in combining the experience of all these manufacturers, in the purchase of material in greater quantities, and in the saving of royalties which the different manufacturers have paid to each other in the past. This last named saving alone amounts to fully $100,000 annually. Secondly, we shall so place the product as to sell direct to the retail dealer from the nearest point of shipment. In this way we can materially reduce the cost to the consumer by saving the profit of the jobber or middleman. In the third place, we shall save greatly in office and road expenses. The total saving, including rebates, to be made by the consolidation, we have estimated at $250,000 a year."

"When will your organization be completed?"

"In the course of a week or ten days. The time fixed for the final transfer of all properties to the new company is August 1. It is expected that there will be one director from each company. The directors will select a president, first and second vice-presidents, a secretary and treasurer and an executive committee of five, as well as committees on sales, manufacturing, and finance."

"What financial provision have you made for carrying on such an immense enterprise?"

"We propose to bond the company for $1,500,000. These bonds will run 30 years and will bear 6 per cent. interest, payable semi-annually, with the provision that at the pleasure of the company they can be taken up at any time at 110. Provision will be made for a sinking fund of $50,000 a year, with which to retire the bonds. Of this $1,500,000 some $600,000 will be used for a part of the purchase and the remainder will be utilized for running the business. Ninety per cent. of the stock of the new company has been taken by the owners of the old companies. The same energy and ability which have in times past insured the success of the old companies will insure the success of the new one."

ODD PLATES.

The Carton Furnace Company of Utica, N. Y., report a satisfactory volume of business thus far the present year as compared with the corresponding period of 1893, the falling off being only 4 per cent. In making this showing the company compare the period this year with the best five months' business in their history. In the number of furnaces sold from January 1 to June 1 of this year there is an increase of 15 per cent. as compared with the same time last year, which certainly speaks well for the popularity of the Carton heaters. Thus far the present year the company

have been shut down only two weeks, and their foundry is now in full operation. Their furnace pipe and fitting departments have been running overtime, and the company report a very small stock on hand, the new venture having proved more successful than anticipated. The fittings and pipes sent out have been favorably criticised, and the company expect to do a large business in this line.

F. E. BROWNE, 314-316 South Spring street, Los Angeles, Cal., favors us with an exceedingly neat and attractive catalogue with testimonial letters of his steel dome hot air furnace. This is the first illustrated catalogue which Mr. Browne has issued, and in it he states that in the future, as in the past, he will be on the alert to keep in the front rank, anticipating the wants of his customers and making his steel dome furnace occupy the highest and most advanced grade. The heater is especially adapted for the climate of California and burns either soft wood or coal. It has a small fire pot and a large radiating drum of heavy sheet steel, made perfectly gas tight. Three sizes are offered, the smallest being sufficient to heat a six to nine room house, the next size ten to twelve room houses, while the largest size is intended for churches and halls. The greater portion of the catalogue, which is entitled "Comfortable Homes and What People Say Who Live in Them," is devoted to half-tone engravings of residences in Los Angeles which are heated by the Browne steel dome furnace, and facing these views are testimonial letters from the owners of the dwellings. Mr. Browne also calls attention in the closing pages to his large and well selected stock of kitchen and household utensils, and to the fact that he has recently added to his assortment Magee's Mystic range, with which our readers are familiar. Mr. Browne also handles the Prize Royal, Dexter and Royal Grand ranges and the Orient lamp heater.

THE PENINSULAR STOVE COMPANY of Detroit have addressed a circular letter to the stove trade, directing notice to their mail order department, a branch of business to which the company are giving particular attention. It very often happens that a dealer in need of stoves holds his order until a traveling salesman calls upon him, but the knowledge of the company's mail order department, where orders received direct command the same careful attention and prompt shipment which characterize those secured by the traveling salesmen, will warrant the dealer in mailing his orders without delay, thus enabling him to supply his customers more quickly than would otherwise be the case. The company state in this circular letter that on account of the extensive territory they are obliged to cover they find it impossible to send a representative into every town, and have therefore established the mail order department. We have received from the company a copy of this circular and also a folder relating to the Peninsular portable wrought steel range, adapted for use of families, restaurants, hotels and public institutions. The goods are made of 14-gauge cold rolled wrought steel and are lined with asbestos.

THE SUPERIOR STOVE & FURNACE COMPANY have just been incorporated under the laws of the State of Ohio for the purpose of carrying on a general wholesale and retail business in the sale of stoves, ranges, furnaces, kitchen ware, &c., with office and salesroom at 94 Superior street, Cleveland, Ohio. They have secured the general agency for the State of Ohio of the line of Superior furnaces, heaters and steel ranges made by the Superior Furnace Company of Little Falls, N. Y.

THE STAR COUPLER COMPANY, St. Louis, Mo., are meeting with excellent success in introducing their couplers. In using this coupler in connecting lead to lead pipe, the soldering or wiping of joints is entirely obviated. It is particularly adapted to connecting the range to boiler, and many stove dealers carry them in stock, as they are enabled to sell the range or stove and set it up complete without outside assistance.

THE PUTNAM FOUNDRY & MACHINE COMPANY, Putnam, Conn., manufacturers of the well-known Plummer steam heater and the Leader hot water heater, have recently completed a new building to be used as a storeroom for patterns and a large shed for the storage of coal and coke. This concern are preparing to bring out a new furnace which will be ready for the market early in July. The furnace has not yet been named, and if any member of the trade has a suggestion and is anxious for the glory of standing godfather for this apparatus, he is invited to send it on a postal card. Mr. Barber has not offered anything in the way of a prize, but doubtless will appreciate the kindness of the trade to the extent at least of giving due credit to the sender of an approved suggestion through *The Metal Worker* and an invitation to the christening.

THE KERNAN FURNACE COMPANY of Utica, N. Y., and with Chicago office at 71 West Washington street, favor us with a descriptive and reference catalogue of the Kernan warm air furnaces for soft coal. The 32 pages of which the little volume consists illustrate and describe the heater named, in addition to which they give the elevations and floor plans of a school house, showing the application of the Kernan system of heating and ventilation. The latest production of the company is the Kernan smoke consumer, for which strong claims are made. In this construction, it is claimed, new and practical results are accomplished, the air being heated and equally discharged into the combustion chamber around the surface of the fire, thereby causing perfect combustion and preventing the formation of soot. In this air passage the claim is made that there are no joints which by contraction or expansion will allow gas and smoke to escape. The grate employed is of hexagonal type, being self cleaning, anti-clinker and rotating bar dumping. The bars are so constructed that air passes between and reaches the center of each. The triangular grate bars are without bolts, suspended within a removable grate frame which can be easily replaced through the ash pit door. The frame is so constructed that each triangular bar has a center support, thus giving three supports to each bar. The closing pages of the pamphlet are given up to testimonial letters, being a few of those received by the company from the soft coal sections of the country.

THE HOOD FURNACE & SUPPLY COMPANY of Corning, N. Y., in referring to the special features embodied in the Cheerful Home improved hot air furnace, state that the line consists of 20 styles and sizes, which have been thoroughly tested by users in all parts of the country. The grate is a triangular revolving bar, cast hollow from end to end. The fire pot is sectional with cup joints and wide flanges, the steel dome has cast wings and the radiator is horseshoe in form, with return flue and down draft, and having automatic gas and direct damper.

E. BEMENT & SONS, Lansing, Mich., are distributing a 16-page pamphlet of pocket size, containing a number of testimonial letters relative to the merits of the Palace Regal Ventilator square parlor stove. The letters are of a complimentary character, and indicate very forcibly the satisfaction which this stove has given wherever used. The makers state that the reason for this wonderful success is its general superiority of design and construction, although they ascribe it largely to the fact that it is so constructed that the hot air and smoke are exposed for a longer time to a great radiating surface.

THE FULLER & WARREN COMPANY, Troy, N. Y., have issued a very attractive four-page folder, illustrating the Air Tight Stewart ventilating parlor stove, made in four sizes and intended for using as a fuel hard or soft coal, coke or lignite. The manufacturers state that under test "a fire has kept continuously for 65 hours with one hod of soft coal." The stove is furnished with either cone or draw center grate, as may be desired, and the parts exposed to the heat above the fire pot are cast in one piece, thus insuring, it is claimed, great durability. The circular shows the stove with and without exterior casing. The space between the stove body proper and the outside casing is open from top to bottom, thus compelling a constant circulation of air by direct radiation upward and outward.

FOR SOME TIME PAST it has been evident that in order to accommodate their increasing business, the William Miller Range & Furnace Company of Cincinnati, Ohio, would have to provide additional quarters. To this end they have recently commenced the erection of a new brick building, which when completed will be six stories in hight. The location of the new edifice is at the corner of Seventh street and Broadway in the city named. The improvements will involve the expenditure of a large sum of money, which is necessitated by the prospective requirements of their business. When the building is completed a force of about 200 hands will be employed. President Miller of the company is reported by a local paper to consider the business outlook good.

ISAAC A. SHEPPARD & Co. of Philadelphia and Baltimore have distributed a four-page circular illustrating and describing the Paragon steel plate furnace. It is made with round and octagon base, the former having a curved cylinder and frictionless draw center grate, while the latter has three different arrangements of grates and cylinders, according to requirements. The Paragon furnaces are well made throughout and embody features which have established for them a gratifying reception at the hands of the trade.

AT THE INTERNATIONAL EXPOSITION now being held at Lyons, France, is a grill room in which every effort is made to present a complete demonstration of the advantages of gas for cooking and for accessory services. Even the roasts are turned by a small gas motor. The kitchen is in full view of the hall of the restaurant.

TIN PLATES.

SCRAP.

CUMBERLAND STEEL & TIN PLATE COMPANY, Cumberland, Md., report that the demand for their black sheets for tinning purposes is so large that their order books are full for a long time ahead, and they are unable at present to fill the demand upon them. The present capacity of the mills is about 75 tons a month, which will be doubled when their new mills are put in service next month.

THE WORKS of the Burry Tin Plate Company, Llanelly, South Wales, will resume operations about July 1.

AN ENGLISH metal trade journal announces that some large orders for tin plates had been recently placed by American dealers. One purchaser had taken 24,000 boxes and another had placed contracts for 50,000 boxes.

AN AGREEMENT having been reached between the owner of the Abertillery Tin Plate Works, Newport, Monmouthshire, and his workmen, the works have been restarted, after a prolonged shutdown, with eight mills out of the eleven which the works contain.

THE DEATH is announced of a well-known Welsh tin plate manufacturer, whose products are familiar to every one in the trade in the United States—Daniel Whitehouse, proprietor of the Abercarne Iron & Tin Plate Works, Abercarne, Monmouthshire. Mr. Whitehouse, who was in his seventieth year at the time of his death, purchased the Abercarne works 40 years ago and made them one of the most important tin plate establishments in the world. He was the active manager of his mills and a very prominent and highly esteemed figure in the English tin plate trade.

PHILADELPHIA is rapidly assuming an unquestionable position as the Eastern center of the American tin plate manufacturing industry. Nine tin plate works, with an aggregate of 60 tinning sets, are now in operation in the Quaker City. All are reported as being busy and as finding a ready market for the whole of the bright and terne plates they can produce. The aggregate output of these nine works must form an important item in the tin plate supply of the Eastern States.

THE TIN PLATE works of Marshall Bros. & Co., 1156 Beach street, Philadelphia, are reported as being full of orders. Their rolling mills are also kept very busy in the production of black plates for tinning, part of the output being used at home and the rest finding a ready market among the Eastern tin plate makers. Messrs. Marshall's American black plates have achieved a high reputation.

RITER BROS. COMPANY, Philadelphia, Pa., importers and dealers in tin plates and metals, have removed their store and offices from 213 Race street to more commodious quarters at Tenth and Arch streets. The firm now occupy all the floors of a new and handsome four-story building, where they enjoy much greater advantages of space, and where they are prepared to do a still larger trade in their well-known special brands of tin and terne plates—namely, Riter's Roofing, Lehigh Ternes and Riter's Brights, as well as in all kinds of bright and roofing plates.

WITHIN the past two months the Falcon Tin Plate & Sheet Company, Niles, Ohio, have increased their facilities for the production of black plates for tinning by the addition of another pair of tin rolls. They have now in operation three pairs of tin rolls and two pairs of sheet rolls. The company have not as yet entered upon the manufacture of tin plates, but have confined their efforts entirely to the production of black plates, of which they turned out 850 tons in the first quarter of this year.

THE PHILADELPHIA IRON & TIN PLATE WORKS, Hughes & Patterson, Incorporated, Beach and Vienna streets, Philadelphia, issue a neat eight-page pamphlet, printed in red and black, as a price-list and advertisement of the American tin and terne plates made by them. These include their guaranteed plates—namely, H. & P. Best Bright, H. & P. Redipped Roofing and H. & P. Best Roofing—as well as a number of other brands of bright and roofing plates. The tinning plant of the Philadelphia Iron & Tin Plate Works comprises six pots.

THE TIN PLATE WORKS attached to the factory of the Chicago Stamping Company, Chicago, Ill., are busily employed in turning out both coke and charcoal plates at the average rate of about 750 boxes a week. All this product is used up on the spot for the purposes of tinware manufacture. The requirements of the Chicago Stamping Company's own factory are so great that hitherto they have not made any plates for sale. But it is in contemplation to add from 10 to 15 more tinning pots to the 4 now in use in order to supply the general market with high grade American bright tin plates. The company inform us that they have entirely abandoned purchasing imported tin plates and that thus far they have only tinned American black sheets. They express the hope that they may be able to purchase enough domestic sheets to keep their works going.

WORK is progressing actively on the construction of the new rolling mill and tinning plant of the Montpelier Sheet & Tin Plate Company, Montpelier, Ind. The company hope to be in operation by September 1 next, with a four-mill plant and about ten tinning pots.

THE AMERICAN TIN & TERNE PLATE COMPANY, 45–49 Richmond street, Philadelphia, are reported as having five tinning sets in constant operation, with an active sale of all the plates they can make. The company are turning out both bright charcoal and terne plates.

UNDER DATE of June 1, the Phillips Tin Plate Company, 918 Filbert street, Philadelphia, have issued a circular calling attention to the tin and terne plates manufactured by them at their works, situated at Susquehanna avenue and Philadelphia & Reading Railroad, Philadelphia. The concern are now making four brands of bright plates—two charcoal and two coke—and seven brands of roofing ternes, which they refer to as being all of Siemens steel, uniformly coated, resquared and guaranteed to seam and double seam. Five tinning pots are in constant operation, having a capacity of 50,000 boxes annually on single turn.

NORRISTOWN TIN PLATE COMPANY, Norristown, Pa., are busy with their full equipment of seven tinning pots turning out both bright charcoal and coke plates, as well as their three brands of roofing tin.

THE FOUR-MILL PLANT of the Ellwood Tin Plate Company, Ellwood City, Pa., is reported in full operation, turning out daily from 40,000 to 60,000 pounds of black plate, pickled and cold rolled, ready for tinning.

THE AMERICAN TIN PLATE MACHINE & MFG. COMPANY, Linfield, Pa., are reported as busily employed in the production of their specialty—continuous roofing plates, made by the Buckman process. The present capacity of the works is 10 tons per day, but additional machinery is now being placed which will double this capacity.

CHICAGO TIN PLATE MFG. COMPANY, 533 The Rookery, Chicago, expect shortly to join the ranks of American tin plate manufacturers who roll their own black sheets. The firm are, we understand, in negotiation for a rolling mill plant and will in all probability be producing their own sheets by the fall. The present product of the company's tin plate works consists of coke and charcoal bright plates, as well as ternes, to the extent of about 1400 boxes weekly.

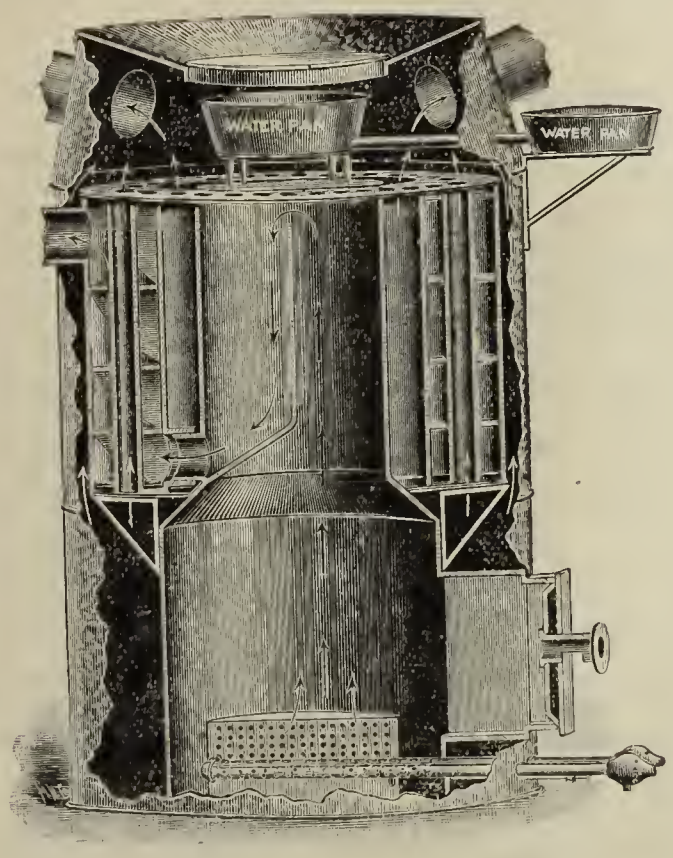
A GOOD EXAMPLE of the artistic tendency in modern trade circulars is found in an attractive 12-page pamphlet which has reached us from C. Sidney Shepard & Co., 23–25 Randolph street, Chicago. The circular is a beautiful specimen of typography and engraving, inclosed in a pale green cover, bearing the firm's name and business stamped in red letters on a silver ground, representing a sheet of roofing terne. It contains an illustrated list of the special brands of American and foreign roofing ternes made for and sold by the company. These include, among domestic plates, Westmoreland, a full weight, heavily coated plate, squared and stamped; Kenwood, a full weight, bright finished terne; Furmston, a terne of Worcester grade, and Apollo. Of imported plates, the well-known brands Worcester, Morriston Old Style and Pontymister Old Style are illustrated and described.

THE CYNON TIN PLATE WORKS and the Nantyglo Tin Plate Works of South Wales restarted this week.

The Spanish Government have proposed the appointment of a mixed commission to settle the difficulty between Spain and the United States in regard to the Cuban tariff.

A Gas Furnace.

The accompanying illustrations show a hot air furnace specially adapted to the use of gas as a fuel that is being put on the market by the Pennsylvania Gas Furnace Company, 77 West Chippewa street, Buffalo, N. Y. Fig. 1 is a sectional view of the furnace, and the company call special attention to the fact that the fire chamber is large and extended and air is admitted to the burners on both sides. A central drum is connected with the top of the fire chamber and extends nearly to the top of the furnace, being crowned with a tight head. This central drum is provided with a partition causing the products of combustion to rise to the top before they can pass down to their exit to the outer drum at the back. The outer drum surrounds the central drum and has a series of hot air tubes passing up through it from the bottom to top. It also has a spiral partition wound four times around its interior, as shown in Fig. 2, by which means the heat of the gases is extracted previous to their taking final exit from the furnace. In this way a very large expanse of heating surface is presented to the cold air which enters at the bottom of the furnace. A very effective means of moistening the air is the arrrangement of the evaporating pan, which is located above the center dome and connected with an outside reservoir. In this way the moisture from the inner pan is distributed evenly through all the pipes leading from the furnace. The dome of the furnace is provided with an opening allowing ready access to the water pan. The outer water pan aids in replenishing with water and also prevents the water from being too quickly raised to a high temperature. It is claimed that the furnace is very durable, as there is no part which ever becomes red hot, and being made of steel plate it responds very quickly to the application of heat. It is said that in five minutes after the gas is burning a current of hot air may be felt in all the registers. Fig. 3 shows a top view of the burners and combustion chamber. A double pipe burner is used with fine perforations, being provided with an air mixer by which the proper amount of air can be supplied. This, with the size of the fire chamber, which provides for an ample flow of air to properly support a flame, produces, it is claimed, a superior combustion and intense heat. The air is admitted to the burner on both sides of the furnace through a perforated shield in fine streams over the top of the burner, which gives a large flame. The admission of the air to the burner is said to be a very important feature. The furnace is arranged with a pilot light and devices by which the fire can be lighted from any room in the house. It is claimed that the combustion for an ordinary sized dwelling is from 20 to 40 cubic feet of gas per hour. The furnace is intended to take the place of coal constructions, both portable and brick set. In cost the furnace is said to be considerably cheaper than the average coal burning device, and that with gas at from 25 to 50 cents a thousand feet is more economical than coal, and with gas at 50 cents to $1 a thousand feet the cost of operation compares very favorably with the use of coal, while great comfort is derived from the regular heat furnished, as well as from the fact that no attendance is needed for fires. A number of the furnaces have been in use during the past winter, and they are claimed to have given entire satisfaction. The furnace is made in four sizes, Nos. 20, 24, 28 and 32, with a hight of 5 and 5½ feet and diameters of 40, 44, 50 and 56 inches, the capacity being 12,000, 18,000, 35,000 and 50,000 cubic feet of space respectively, with somewhat increased capacity in churches or buildings more readily heated than the ordinary dwelling.



A Gas Furnace.—Fig. 1.—Sectional View.

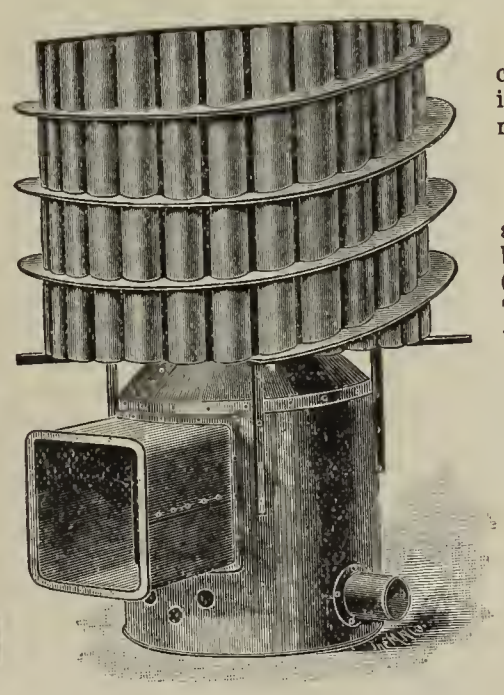


Fig. 2.—Radiating Drum with Spiral Flue.

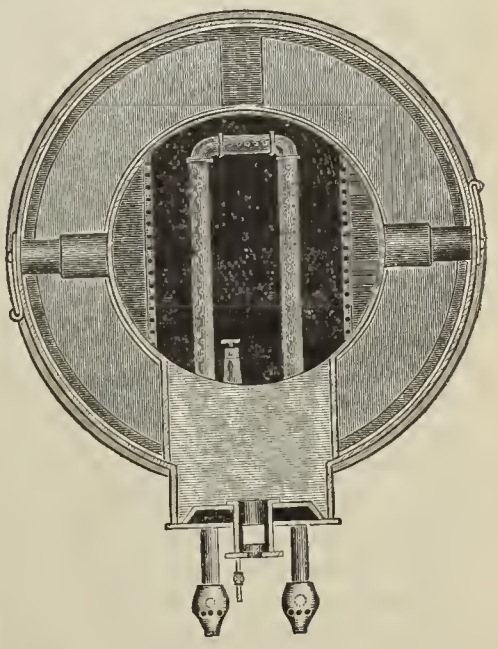


Fig. 3.—Top View of Burners and Combustion Chamber.

The New York and New Jersey bridge, authorized by Congress and approved by the President, will cost nearly $40,000,000, according to present estimates. The company are bound by the terms of the bill to complete the structure in ten years. Moreover, they are required to expend at least $250,000 the first year and $1,000,000 annually until the work is completed. They expect to arrive at this consummation in half the time required by the law.

With the view of warding off distress among the agricultural population in seasons of crop failure, Russian statesmen are preparing a scheme for the insurance of crops by the State. The insurance is to be compulsory so far as farming lands are concerned, the rates varying according to the conditions of the various districts.

At a recent meeting of striking coal miners in Illinois, it was desired to adopt a set of resolutions. In order that all present could vote intelligently, the resolutions had to be translated into French, German, Italian, Belgian and Polish.

PLUMBING and GAS FITTING.

Twelfth Annual Convention of the National Association of Master Plumbers.

The National Association of Master Plumbers held their twelfth annual convention in Detroit, Mich., this week. It was the largest ever held, and significantly demonstrated the growing power of this great organization, whose membership extends from ocean to ocean. Founded in 1883 by comparatively a corporal's guard, anxious to advance the interests of their craft, which they believed could best be accomplished by organization, the association has grown from year to year, every twelvemonth showing a great gain on the preceding one. The past year was the banner year in its history, numerous localities coming into the fold which had for some reason or other held aloof.

So much has been accomplished, however, in State and local legislation for the betterment of the trade and the weeding out of unskilled or otherwise incompetent men through the influence of the association that its benefits have been too apparent to withstand, and therefore those who have hitherto been indifferent toward the association have latterly been hastening to enter its ranks. The matter of trade protection as embodied in the famous Baltimore resolutions, which in the beginning was a formidable undertaking, has also been prosecuted very successfully, and manufacturers and jobbers are finding it to their best interest to recognize master plumbers as exclusively entitled to handle plumbers' supplies. This work could not have been carried on to its present satisfactory condition without the most able management as well as the most perfect harmony among officers and members. Petty jealousies, bickerings and quarrels have not divided their councils, but unanimity of purpose has been the animating spirit. From this has grown the superb success exhibited by the association as it stands constituted today.

Delegations from the various sections of the country began to assemble at Detroit several days before the time fixed for the formal opening of the session on Tuesday. On the previous Saturday not a few arrived. Their numbers were considerably augmented on Sunday, but a great host made its appearance from all points of the compass on Monday. The Executive Committee of the association held a preparatory session on Monday afternoon at the Hotel Cadillac for the purpose of arranging some necessary details and giving the final touches to the report of their work during the year. This committee consisted of the following members:

President, Daniel G. Finnerty of Boston.

Vice-president, John Mitchell of New York.

Recording secretary, David Smith of Boston.

Treasurer, W. E. Goodman of Milwaukee.

Jeremiah Sheehan of St. Louis.
Thomas H. Radcliffe of Brooklyn.
J. J. Wade of Chicago.
H G. Gabay of New York.
James G. Weldon of Pittsburgh.
M. J. Duffy of Louisville.

TUESDAY MORNING.

The members of the various delegations assembled at the Hotel Cadillac at 9 o'clock, and formed in procession to march to Philharmonic Hall, the place of meeting. It was an imposing demonstration, by far the largest on any similar occasion. It was headed by a band of music, and paraded through a number of the principal streets and past the leading hotels. The different delegations had their banners with them, all wore distinctive badges, and in some cases a feature of uniformity was introduced in the matter of hats. For the first time the Knights of Tabasco, an organization of traveling salesmen in the line of plumbers' supplies, turned out in force as part of the plumbers' procession at a national convention. They had provided their own band, marched with military precision, carried appropriate streamers, and performed entertaining maneuvers with umbrellas decked with crimson ribbons.

On arriving at the hall the convention was called to order by President Daniel G. Finnerty, who looked around with evident pleasure on the large assemblage. The platform on which the officers sat was decorated with tropical plants, the walls were draped with flags and banners, above was a huge canvas inscribed "Welcome, Master Plumbers," but the most charming feature of the whole was a large gathering of ladies in the gallery who had come to witness the opening exercises. In a few well chosen words President Finnerty greeted the assemblage and introduced President J. H. Crumley of the Detroit Master Plumbers' Association, who welcomed his fellow craftsmen in a short speech. He next introduced George Beck, president of the Detroit City Council, who extended a cordial greeting to the association in behalf of the Mayor, who was unavoidably absent. Mr. Beck made an eloquent address, replete with humor and yet highly dignified. During the course of his remarks he referred to his own short career as a master plumber, which was hopelessly checked by the publication of one of his bills, in which he had charged $3.68 for finding leaks in a pipe and 16 cents for repairing the same.

The president then appointed Thomas F. Norris sergeant-at-arms, and Charles Dullea assistant, both of Detroit. A Committee on Credentials was then appointed, consisting of:

T. J. Culloton of Chicago.
W. H. Rothrock of Baltimore.
S. E. Dibble of New Haven.
D. J. Collins of St. Louis.
William McCoach of Philadelphia.

The convention adjourned until 2 p.m. to await the report of this committee.

TUESDAY AFTERNOON.

Chairman Culloton of the Committee on Credentials submitted its report, showing that 389 delegates were present, representing 22 local and 10 State associations. This is an increase of over 30 per cent. in the working membership of the convention in one year. A question arose as to the representation of the State Association of Michigan, which had sent in the names of ten members residing in towns without local associations in addition to three delegates at large. This question caused an extended discussion, which was terminated by the president's decision that the association was entitled to only three delegates.

The complete list of delegates in attendance, as reported by the Committee on Credentials, to which must be added the State vice presidents, who are ex-officio members of the convention, is as follows:

List of Delegates.

CALIFORNIA.

Los Angeles. George E. Howe, F. M. Parker, W. D. Newell, A. B. Cass, F. M. Crimmins; San Francisco, Thomas J. Ford, John L E. Firmin, J. B. Butterworth, P. F. Ward, R. A. Vance, S. Ickelheimer. W. M. Tobin, Charles J. Reilly, H. Williamson, James Shepard.

CONNECTICUT.

Bridgeport, H B. Middlebrook, M. A. Green, L. H. Mills; Connecticut

State Association, James Ahern, S. E. Dibble, John M. Page; Hartford, George Mahl, James F. Duffy; New Britain, J. B. Weiant; New Haven, Andrew J. Clerkin, S. E. Dibble, F. A. Curtiss.

INDIANA.

Evansville, Charles Wahnseidler; Fort Wayne, Robert Spice, E. Martin; Indianapolis, George Kirkhoff, Thomas Clark.

DELAWARE.

Wilmington, James F. Trainor, Alfred Gawthrop.

WASHINGTON, D. C.

J. R. Quinter, E. J. Hannan, J. Ragan, D. Harman, James Nolan, James Cunningham.

ILLINOIS.

Chicago, Paul Redeiske, J. J. Wade, Wm. T. Geary, C. J. Herbert, P. Sanders, T. P. Culloton, G. A. Larsen, Thomas Conway, C. C. Breyer, D. J. Rock, P. M. Murphy, A. C. Hickey, J. F. Roland, Jos. B. Breen, M. L. Mandable, E Baggott, J. H. Deviney, J. H. Roche, Wm. H. Cummings, J. G. Weber, A. W. Murray, J. J. Doyle, R. H. Lear, J. P. Newburg, C. J. Boyd; Illinois State Association, John M. Simpson, Robert Loudon, James R. Scanlan; Peoria, D. O'Connor, John O'Neil, Jr., Charles W. O'Neill; Rockford, E. S. Gregory.

IOWA STATE ASSOCIATION.

J. A. Harris, John E. Allen, John Burnside, A. H. Walker, Henry Ewinger.

KANSAS STATE ASSOCIATION.

James Foley, P. Bertram, C. J. Prescott, F. H. Bowers.

KENTUCKY.

Henderson, L. C. Klee; Louisville, A. M. Ramsey, S. Shulhafer, John Ryan, M. J. Duffy, Wm. H. Matlack.

MAINE.

Lewiston and Auburn, John B. Smith.

MARYLAND.

Baltimore, W. H. Rothrock, John Trainor, George Knipp, B. N. Sullivan, W. W. Rowles, J. F. P. Carey, E. J. Healy, Jr., C. H. Frederick.

MASSACHUSETTS.

Boston, J. W. French, J. W. Cosdon, David Smith, J. F. Dablin, T. E. Sharp, P. H. Winn, E. C. Kelly, D. G. Finnerty, T. J. Hartnett, Isaac Riley, W. A. Tucker, J. S. Boyd, C. M. Bromwich, James O. Connell, A. Williams; Holyoke, C. P. Lyman; Massachusetts State Association, T. J. Carmody, D. D. Casey, J. W. Green; Lowell, Thomas Costello, P. F. Corston, D. H. Wilson, S. H. Jones; New Bedford, F. M. Gifford; Salem, F. A. Wendell; Springfield, W. H. Selvey, M. A. Donohue; Worcester, J. F. Deedy, H. A. Desper, J. W. Jordon, J. C. Luby.

MICHIGAN.

Albion, W. J. Poor; Ann Arbor, T. F. Hutzel, Robert Gwinner; Battle Creek, J. C. Gallup, A. F. Bock; Bay City, W. H. Sullivan, A. Walther; Benton Harbor, A. Brammal; Michigan State Association, James Meathe, John A Wheeler, William Lloyd; Detroit, George Lane, J. W. Partland, T. F. Norris, Richard Walsh, P. C. Stimer, Charles Dullea, J. H. Crumley; Flint, E. Werner; Grand Rapids, F. Shriver, Wm. Robertson, W. T. McGurrin, Warren C. Weatherly; Ionia, R J. Breckon, Loomis Mann; Jackson, S. J. Wirt, G. H. Porter; Kalamazoo, S. M. Radigar, J. Dekman; Lansing, F. C. Bennett, R. H. Black; Mount Clemens, Anthony Czizek, Michael M. Smith; Port Huron, W. Gibson, J. Bradley; Saginaw, C. R. Bridgeman, F. Archard; St. Joseph, M. W. Jackson, W. Dennes; Ypsilanti, J. E Lambert, Wm. Harding.

MINNESOTA.

Duluth, Allen Black.

MISSOURI.

Kansas City, H. Goss, R. B. Farley, George P. Kirtly; St. Louis, D. J. Collins, P. Madden, W. Mortimer, E. J. Lonergan, E. P. Reardon, James McCartin, John McMahon, E. Schoeneman, John Quinn, J. C. Mitchell, J. Kelly, J. Shelley, W. F. Stein, J. M. Life. E. F. Gardner, C. H. Carroll, E. C. Zausch, Jeremiah Sheehan; Missouri State Association, L. V. Cross, M. J. Ward, C. D. Rogers.

NEW HAMPSHIRE STATE ASSOCIATION.

F. A. Lane, P. A. Gifford, F. I. Lessard.

NEW JERSEY.

Morristown, W. H. Moslar; Newark, E. Berla, A. Don; Passaic, John Hickman, L. McBride.

NEW YORK.

Albany, H. F. Wescott, Thomas Hyde, J. E. Dungan; Brooklyn, M. Fallon, T. H. Radcliffe, C. W. Evans, J. W. Kelly, W. J. Galt, H. L. Potter, J. Zoll, R. J. Knox, W. E. Williams, Oscar O. Sawkins, George Mong, J. J. Keenan, G. B. Lewis, G. H. Smythe, W. Gardner, C. F. Mentzinger, Louis Haff, H. J. McBride, John E. Quattlander, H. M. Noble, Edwin Hayward; Buffalo, J. F. Stygall, Jr., C. B. Huck, Charles Ceiger, J. L. Mensch, F. L. Byer, George Engel. F. H. Yuhl, A. C. Cranichfeld; Jamestown, John Conway, James Callahan; Kingston, T. J. Cusack; New York, Col. George D. Scott. John Burns, John Mitchell, H. G. Gabey, H. J. Patterson, Charles Schloesser, T. J. Tuomey, William Young, John Yule, E. J. Brady, S. Malcolm, M. Ryan, John McCarron, J. W. O'Brien, Frank Reynolds, Timothy Sullivan, Phillip Smith, J. R. Corbitt, Alexander Cameron, W. McDermott, T. J. McCormack, Adam Huston. J. M. Morton, C. Frazer, T. Martin, E. P. Mahoney, J. Walsh, Jonas A. Rossman, W. Kirchoff, C. H. Kranichfelt, T. McCaull, Francis Callahan, John Regan, J. J. Sullivan, James Muir, J. O. Shumway, T. R. DeLacey; Poughkeepsie, T. A. Waters, Peter Adriance, Charles Cook, E. C. Goherty; Rochester, J. A. Barr, J. A. Creelman, George Dodds; Syracuse, B. J. O'Donal, R. C. McClure, F. W. Wagoner.

OHIO.

Cincinnati, Charles Homan, A. A. Deihm, J. A. Gibson, C. L. Heller, Jr.; Cleveland, D. H. Roberts, E. Eller, W. N. Cleveland, W. J. Warden, Chas. Streever; Ohio State, C. C. Dewstoe, L. Poplowski, Robert Raitz; Toledo, J. A. Walt, J. S. Schultz, J. P. Lawrence.

PENNSYLVANIA.

Altoona, H. J. Bohn, Albert Akers; Harrisburg, John A. Kramer ; Meadville, Joseph Hampson; Philadelphia, John E. Ryanson, Wm. McCoach, A. L. Hicks, W. M. Harkness, Jr., Wm. L. Owens, Jr., C. W. Barnes, W. H. Doyle, F. P. Brown; Pittsburgh, R. J. Bradshaw, J. O. McGinness, F. J. Gray, J. Rice, Frank McKnight, C. H. Humbert, A. R. Tate, J. J. Cowling, F. P. Blythe.

RHODE ISLAND.

Newport, James Openshaw; Pawtucket, David L. Fales; Providence, P. Tirney, J. C. Conroy, F. C. Lees, W. M. Congdon; Rhode Island State, S. Jackson, T. L. Phillips, J. S. Fuller.

SOUTH CAROLINA.

Charleston, O. S. Miscully.

TENNESSEE.

Memphis, J. A. Bailey; Nashville, M. P. Baine, G. Denerich.

TEXAS STATE ASSOCIATION.

C V. Ackley, A H. Wainright, J. F. Madden, Thomas Henderson.

WISCONSIN.

North Shore, John Eiden, C. H. Goodman; Milwaukee, Charles Poluchek; W. E. Goodman, Fred Wittig, W. H. Halsey, A. R. Schwind, E Crassler, L. H. Plum; Racine, H. Raymond, C. Hullett; Northwestern of Oshkosh, W. S. Patterson, J. F. Ahern, M. A. Dunning; West Superior, Joseph Neil.

The following Committee on Resolutions was next appointed by the president:

E. J. Hannan of Washington.
Edwin Hayward of Brooklyn.
S. L. Malcolm of New York.
J. Warren French of Boston.
L. B. Cross of Kansas City.

The following Auditing Committee was also appointed:

John Trainor of Baltimore.
J. A. Harris of Sioux City.
R. J. Knox of Brooklyn.

An adjournment was then taken until 9 o'clock Wednesday morning.

WEDNESDAY MORNING.

The delegates gathered slowly in the convention hall this morning, and it was nearly 10 o'clock when the president's gavel called them to order. John Trainor of Baltimore moved a reconsideration of the vote by which the report of the Committee on Credentials had been adopted. The discussion of this question consumed much time and required a roll call for its settlement, but it was defeated.

Edwin Hayward of Brooklyn, chairman of the Committee on Essays, reported that contributions had been received from Dent Yates of Kansas City, P. L. Moffitt of Brooklyn, S. E. Dibble of New Haven, ex-President Jeremiah Sheehan of St. Louis, Theodore P. Watts of Louisville, L. F. Meyer of Milwaukee, C. C. Dewstoe of Cleveland, the Sanitary Committee of the Master Plumbers' Association of Worcester, Mass., John L. E. Firmin of San Francisco, and E. J. Healy, Jr., of Baltimore. The time for hearing these essays was fixed at 1 o'clock on Thursday afternoon.

Alex. W. Murray of Chicago, chairman of the Sanitary Committee, read the following report, which was signed by himself and A. C. Hickey, M. L.

Mandable, David Whiteford and T. C. Boyd:

Report of the Sanitary Committee.

Your Sanitary Committee respectfully report as follows: Were it possible for your committee to intelligently investigate every subject that might properly be within the purview of the little "Sanitary," a proper discussion of the report would demand too much of the limited time of this convention.

Article 2 of your constitution contains the theory by which the office of Sanitary Committeemen was established. One of the tenets being "This association is organized for sanitary purposes," it is therefore the duty of the members to qualify by training so that their sphere of usefulness may be enlarged, and be able by logical reasoning to convince the public of the benefits to be derived from the adoption of improved methods of construction, the best quality of materials, and of the importance of employing skillful workmen. The tendency of the age being to the encouragement of the specialist, by which greater perfection is attained in the useful arts, the public expect from the hands of the plumber the same rate of progress in ministering to their comfort, but to be properly qualified to judge which are the correct methods for obtaining perfect sanitation in house construction requires more talent than has yet been developed in any one man. Therefore when the source of water supply has been discovered and the chemist has analyzed its properties, and the physician has stated that it is good for domestic use, it yet requires the plumber to be intelligent and skillful in the use of the material and appliances for it to be stored and utilized and the final disposition of its wastage, so that the education of the craft, beginning with the apprentice, should ever be one of the fundamental principles of this association. And while this association is doing its part by self-training, it is evident that the public, to be fully benefited, must encourage the enactment of such laws that will prevent the ignorant and unskilled from supervising or practicing the art of plumbing, making the examination of those engaged in plumbing and house drainage by a competent board compulsory; requiring the issuance of certificates of proficiency to those who have passed a creditable examination; granting certificates for work properly executed and compelling a periodical inspection of buildings by the sanitary police.

Words of ours are not needed to convince the plumber of the many benefits mankind would derive from the general practice and adoption of the foregoing, because his every day experience has given evidence of their necessity; but the public have not the same opportunities to observe the causes demanding such strict measures. It is irrational to expect an inexperienced or slothful workman to do a first-class job, though he had the best of material to use. Were they compelled by law to have a diploma certifying to their ability, it would give more assurance that the concealed work, as well as that which is exposed, had been properly done, and if to this was added the certificate of the Department of Health that the work had stood the properly applied tests and was executed in accordance with the sanitary code of the city laws, badly executed plumbing would disappear.

House to house inspection would lead to the detection of much that causes sickness and death. It would discover the clogged and leaking sewers, waste and supply pipes, thousands of plumbing fixtures and ice boxes without traps, thousands of water closets reeking with filth and without sufficient water supply, hundreds of basements used as the public dump of the building, many of which germ beds of disease are simply used as storage for fuel. Yet too many are the storage rooms of many food products, and of those that are the kitchen of the gilded restaurant and saloon, their name is legion.

House to house inspection, with authority to remedy these evils, would do much to lessen the epidemics of smallpox, fevers and cholera. Much of the defective supply to water closets in buildings of some cities is caused by waste of water from leaking faucets or pipes. Their dribbling leaks make the premises damp and prevent the water flowing to the upper floors of buildings. The general use of water meters would very much reduce this waste and afford an abundance of water where there is now a scarcity. The disposal of waste water from ice boxes or refrigerators does not receive as particular attention from the householder as its importance from a sanitary standpoint deserves. When making examinations of premises a close scrutiny of the manner of getting rid of the waste from the ice will reveal much that is defective.

A general word on sanitation: Wherever man inhabits the earth effective sanitation is visible, either in a low death rate where civilization and the advancement of the race is marked, or the opposite. Where a low grade of humanity congregate together and disregard the laws of sanitation by living in filth the death rate will be enormous. Especially will the hand of death show itself should an epidemic stalk abroad. Cleanliness, pure air, pure water, healthy food and proper clothing are the first laws of sanitation, which must be obeyed by the human family if they want to be healthy. Do you consider how the laws of nature shake off the cloak of disease from her shoulders? For instance: Contaminate a pure stream of water with any vile substance. Note that the very instant you stop polluting the stream it begins to purify itself by depositing the sediment on the bottom and throwing off the noxious gases to the air. Before the river has traveled 50 miles nature will have asserted herself and the river will again be fit for man and beast to partake of.

Again, nature inclines to sanitation. Take any large city; the inhabitants contaminate the air by all kinds of gases, dust, garbage, outhouses, defective sewers, polluted water, damp cellars, dead animals and filthy gutters, which are contrary to the laws of sanitation. If this were not remedied man could not live on this earth; because of his own neglect he would perish.

It is of no use to remind you of the disregard of sanitary laws by our forefathers for the past 3000 years; of whole countries being laid waste by black death through their disregard to sanitation. It does not matter whether you disobey them through ignorance or carlessness; whether you live in a hovel or palace, your neglect will find you out. Read ancient history and you will find our words as true as holy writ. Is it not a fact that man is slow to move in the direction of sanitation? Thousands of dollars are lavishly spent in the beautifying of buildings, while the sanitary appliances do not receive the consideration they deserve. There is no question but that the public are slow to get on the fast train, the wheels of which are run on the line of sanitation. But we are advancing slowly, and all along sanitary appliances are being gradually introduced.

The master plumbers have been in the vanguard in advancing sanitary laws and sanitary plumbing for the last ten years, and we believe we have done more than any other class of men to make healthy homes. Even the physicians acknowledge the plumber as a sanitarian in the prevention of diseases. Boards of health and officials consult us on sanitary law. Your committee would recommend that all local associations should take up for the coming year laws governing plumbing and undertake to have them passed through their reapective legislatures and city councils. In conclusion, to make the home of the soul an earthly paradise:

The heart must pump, in temperate mood,
  Life blood through each artery and vein,
The stomach wisely fed, with wholesome food
  And rest afforded the weary brain,
The body of its wastage purged,
  And cleansed by exercise and bathing,
The senses by excess not blurred,
  And lungs pure air inhaling.

The recommendations of this committee were adopted unanimously.

C. S. Paul of Los Angeles, chairman of the Apprenticeship Committee, presented the report of that committee, which was read, but on motion was referred back to the committee with instructions to make some changes. Subsequently the matter was referred to local associations.

State Vice-Presidents' Reports.

Reports of State vice-presidents were next called for. Patrick Tierney reported that Rhode Island was well organized, every city having its own local association.

The report for Michigan, made by F. Shriver, stated that great progress had been made in the membership of local associations.

James F. P. Carey, reporting for Maryland, alluded with gratification to important legislation secured.

Complete harmony among the fraternity was reported for Connecticut by James Ahern.

Protective legislation was reported as making encouraging progress in Tennessee by J. L. Park.

The little State of Delaware came up with a very encouraging statement of progress by Alfred Gawthrop.

New Hampshire was shown to be in good condition by the report of R. G. Donnelly.

The Kansas report, by James Foley, dwelt upon the improvement in plumbing work accomplished by the efforts of the master plumbers' associations.

Minnesota was shown by Allen Black to be a rather discouraging field for association work, but there was no evidence of any disposition to weaken his efforts to advance the interests of the general cause.

An entertaining but instructive report was rendered for Massachusetts by John F. Deedy, who gave details of methods pursued in pushing the work of organization in that State.

A very prosperous condition of affairs was reported for Washington, D. C., by James Ragan.

In marked contrast with this rosy statement was the report for Nebraska by James H. O'Neill, who set forth the depressed business situation in that commonwealth.

An excellent report for Missouri was presented by J. M. Life.

Indiana was shown to be a difficult field in which to work, according to Geo. F. Kirkhoff.

A brief but good report on Southern California was made by Geo. E. Howe.

A satisfactory state of affairs in New York was presented by Wm. N. Tobin.

Iowa was shown to be exceedingly well organized by Henry Ewinger, who, however, deplored the slowness with which sanitary legislation was being perfected by the State.

Trade protection appears to be pretty generally enjoyed in Texas, according to the report of Ed. Braden, Jr., who also submitted copies of ordinances of Texas cities governing the plumbing business, to show the progress being made in that State.

An adjournment was then taken until 2 o'clock.

WEDNESDAY AFTERNOON.

A congratulatory telegram was read from President E. Rutzler of the Master Steam Fitters' Association, in session in New York, as follows:

We send congratulations on your successful meeting and hope each association will secure complete trade protection.

A telegram in the same vein was ordered to be forwarded to the Steam Fitters' Convention.

Ferdinand Wittig's report for Wisconsin was then read, setting forth the progress made in his State in the past year, and giving some details regarding specific points of advancement.

E. J. Hannan, chairman of the Committee on Resolutions, then read his report, which covered a number of subjects that had been referred to the committee for their consideration. One relating to apprenticeship was recommended by the committee to be referred to the Executive Committee, to be reported upon at the next convention, which was accordingly adopted. Several resolutions covering proposed changes in the constitution were read, and on motion referred to a special committee of five, to report at the next convention. A resolution from the Master Steam and Hot Water Fitters' Association of the United States, asking the co-operation of the National Association of Master Plumbers in the matter of purchasing supplies, was referred to the incoming Executive Committee with power to act.

A resolution presented by J. J. Wade of Chicago set forth the fact that many architects and builders persisted in specifying foreign pottery, and he therefore recommended the appointment of a special committee of five to investigate the comparative merits of foreign and domestic pottery and report at the next annual convention. The Committee on Resolutions recommended that the resolution be non-concurred in, but that "all master plumbers give their preference to home industries in the purchase of supplies." The convention approved this recommendation by a unanimous vote.

Thos. P. Watts, vice-president for Kentucky, then made his report for that State, showing a very creditable record of work. The condition of association matters in Pennsylvania was well portrayed by J. L. McShane, who also referred in suitable terms to the demise of James G. Weldon of that State.

The report of W. T. Geary for Illinois gave particulars of the recent formation of a State association in that commonwealth, and the gratifying manner in which his efforts in that direction had been supported by the Illinois master plumbers.

The report of the financial and recording secretary, David Smith of Boston, was then read, showing a grand total of dues collected for the past year of $5841. The convention then adjourned until 9 o'clock Thursday morning.

Wednesday evening was pleasantly passed by the members of the association, their ladies and friends at the Ben Hur farm of A. J. Alexander, near Walkerville, Ontario. Mr. Alexander, who resides in Detroit and is known to fame as the manufacturer of the Ben Hur closet, furnished a steamer free of expense for the trip to the farm, and there provided a bountiful repast, which was partaken of at tables spread in a great apple orchard. It is estimated that over 1000 persons were entertained on this occasion by Mr. Alexander.

THURSDAY MORNING.

(By Telegraph.)

Convention was called to order at 10 o'clock. No committees being ready to report promptly it was proposed to begin the reading of essays, but the delegates were not in a mood to listen to them, and by motion a resolution was adopted ordering them printed as part of the proceedings.

The report of the Executive Committee was then read. They reported that they had held four meetings during the year. The first was at Pewaukee Lake, Wis., on June 16, 1893, at which the proceedings of the convention just held were ordered to be printed and distributed, which was done in seven weeks. Also at this meeting the salary of the executive clerk was fixed at $18 per week and the *per capita* tax for the year at $2. Further, the president was directed to write to the presidents of local associations and get the names of all manufacturers of plumbers' supplies in sympathy with the aims of the association. This was done, and a list was afterward printed showing 210 names, to which 16 more were subsequently added. The second meeting was held at Boston, February 13 and 14, at which it was decided that the appointment of a joint committee representing the Master Plumbers' Association and the Steam and Hot Water Fitters' Association was advisable, and the latter association was so notified. At this meeting it was resolved to recommend to the association that representation in the National Convention should be reduced to one delegate to every 15 members in local associations instead of one to ten, as at present. The third meeting was held at Hotel Cadillac, Detroit, June 18, at which it was resolved that the association should furnish all supply houses with lists of members of local associations. A proposition was received from the United Association of Journeymen Plumbers asking for the formation of a joint committee, composed of representatives of the two bodies, to adopt measures for the avoidance of strikes and disagreements; recommending the adoption of a plan of arbitration and also the settlement of the apprenticeship question. The fourth meeting was held at Ben Hur farm, Canada, June 20, at which an appropriation of $500 was made to help to defray the expenses of the Detroit meeting, as the Detroit local association was a new one. The recommendations of the Executive Committee were referred to the Committee on Resolutions, to report what action they might deem advisable.

The following special committee was appointed on the proposed revision of the constitution, to report at the next convention:

Edwin Hayward, Brooklyn.
Paul Redeiske, Chicago.
J. W. McDermott, New York.
H. Humbert, Pittsburgh.
George Knipp, Baltimore.

Treasurer W. E. Goodman next read his report, showing an amount on hand at the beginning of the fiscal year of $3034.20; received during the year, $5907.85; making a total of $8942.05. Expended during year, $4383.21, leaving a balance now on hand of $4558.84. The reading of this report excited much enthusiasm.

A Committee on Resolutions on the death of James G. Weldon of Pittsburgh was then appointed as follows: John Trainor, Baltimore; Wm. McCoach, Philadelphia; J. L. McShane, Pittsburgh, who subsequently reported a series of very appropriate resolutions which were adopted by the convention by a rising vote.

At the suggestion of Andrew Young of Chicago that the association should annually be represented at the meetings of the American Public Health Association, a motion was adopted that hereafter the president of the National Association of Master Plumbers should attend as regular representative of the association.

It was next decided to vote on the proposed change of the basis of representation of local associations in the national convention, when a large majority voted down the attempt to limit the representation to one delegate to 15 members.

The place of holding the next annual convention was taken under consideration, and after the claims of Philadelphia had been eloquently set forth by Messrs. McCoach, Hayward, Cross, Doyle, Collins, Redeiske, Dewstoe and Burns, nominations were closed, making the choice of Philadelphia unanimous.

Paul Redeiske of Chicago moved that hereafter the Executive Committee should endeavor to arrange the time for holding the convention so as not to conflict with other conventions in allied trades, which brought out the statement from the president that he had endeavored to so arrange matters this year, but that it was the fault of other associations that there was a conflict of dates.

Dr. Reynolds, Chief of the Board of Health of Chicago, was then introduced to the convention and made a graceful and complimentary address, stating, among other things, that every year Chicago adds new buildings that if placed in a straight line would extend 50 miles, every one of which is twice inspected during erection under plumbing regulations approved by the National Association of Master Plumbers.

President Finnerty's report for the past year was then read, giving a remarkable statement of a vast amount of work performed in extending the influence and building up the membership of the association. There are now 2921 members, an increase of 464 over last year. Over 100 firms signed the Baltimore resolutions. A vote of thanks was given the president for his able report.

E. J. Hannan, chairman of the Committee on Resolutions, presented a report on the recommendations of the Executive Committee, favoring the adoption of all, but suggesting that with relation to arbitration all such committees should be appointed from local associations and not by the national body. The report was unanimously approved.

The Texas delegation extended an invitation to the association to meet at some point in that State in 1896, promising a very cordial reception and excellent entertainment. The convention then adjourned until 2 o'clock, and immediately after adjournment the members and ladies met in the open air near by and were photographed.

THURSDAY AFTERNOON.

The convention met at 2 o'clock and immediately went into executive session. The doors were opened at 5.10 o'clock, and the first business presented was the report of John Trainor, chairman of the Auditing Committee, who reported that he had found the accounts of the officers correct.

The convention then proceeded to the election of officers. The president appointed as tellers.: Frank Reynolds of New York, Edward Baggot of Chicago and T. J. Hartnett of Boston.

Candidates for president were nominated as follows: Daniel G. Finnerty of Boston, John Mitchell of New York, Jas. J. Wade of Chicago, Jas. R. Meath of Detroit, Daniel L. Sullivan of Texas. The merits of each candidate were set forth in eloquent terms by good speakers. Nominations were closed and the balloting began, in which very great interest was taken. Five ballots were necessary to record the choice of the convention, which resulted in the election of John Mitchell, who was then escorted to the platform and expressed his thanks for the honor conferred upon him.

Nominations for vice-president were next made, as follows: William H. Doyle of Philadelphia, and L. B. Cross of Kansas City. Mr. Doyle declined the honor, and moved that the secretary cast one ballot for Mr. Cross, thus making his election unanimous, which was accordingly done. Mr. Cross was then escorted to the platform and thanked the convention for the honor.

The only other elective office was that of treasurer, for which William E. Goodman of Milwaukee was nominated and unanimously elected. Mr. Goodman was escorted to the platform and gave expression to his thanks.

President Mitchell announced that he would appoint as financial and recording secretary Henry J. Petersen of New York, and his choice was immediately ratified by the convention.

Paul Redeiske of Chicago moved that a vote of thanks be tendered the retiring officers, the citizens of Detroit and the press, which was adopted. Thanks were also voted to A. J. Alexander of Ben Hur farm for his entertainment of the association, and to the ladies of Detroit, for entertaining the ladies of the members. The roll of vice-presidents was called, and the delegations from the several States named their choice for the ensuing year. Many were continued from the previous year.

The president announced the following members of the Executive Committee:

Jas. Meath of Detroit.
Henry G. Gabay of New York.
John Trainor of Baltimore.
C. C. Dewstoe of Cleveland.
Paul Redeiske of Chicago.

Adjourned *sine die* at 11 o'clock p.m.

PHILIP SMITH of New York, observing that the president was provided with a gavel of very ordinary appearance, deemed it desirable for the maintenance of the dignity of the office that a better emblem of authority should be in his hands. He therefore procured and presented to President Finnerty a handsome rosewood gavel, decorated with a red, white and blue ribbon.

Pads and Joints.

A PARLOR at the end of the main corridor of Hotel Cadillac was used as an exhibition room, and a greater display of manufactured articles made than has heretofore been customary.

THE ROTUND FIGURE of John Davis of the Windsor Mfg. Company, Milwaukee, was seen everywhere, but lead and tin pipe talk was left at the press.

THE SEDATE FACE of the eloquent and humorous Albert E. Hyde relapsed into a genial smile for each plumber, for he knows them all as well as he does the James B. Clow Company's catalogue. His fellow laborer, W. H. Morse, was equally at home with the delegates.

THOMAS SPENCE of the Rundle & Spence Mfg. Company, Milwaukee, left Mr. Rundle at home to make soil pipe and plumbers' brass goods, while he renewed his acquaintance with the fraternity in which he labored when he first worked for shillings.

VALVE BOXES, hydrants, malleable and cast fittings for plumbers and steam fitters are agreeable topics for conversation when talked by Fred Hahne of the Illinois Malleable Iron Company, Chicago.

AN ATTRACTIVE square sign with a white background bore in red and black letters, "H. B. Smith Company, Westfield, Mass. Union and Gold Pin Radiators, Gold, Mills and Mercer Boilers and Cottage Heaters." A table beneath was laden with literature and J. H. Towle had a word for all.

A. P. RICHARDSON of the American Boiler Company was at home in every group of plumbers with his smile and greeting, but not a word about the Perfect, Florida, Spence and Soleil steam and hot water boilers.

M. L. FOOTE is an agreeable representative of the heating and ventilating department of the Kewanee Boiler Company, Kewanee, Ill.

GRANT C. BRETTELL showed the Eureka smoke test machine, made by the Bailey-Farrell Mfg. Company, Pittsburgh. It attracted much interest and is highly praised by the Pittsburgh plumbers, who strongly advocate the smoke test in preference to all others. Leaks are readily found that would require careful search with any other method. He also distributed circulars of the Bennett water pressure regulator for delivering water from high pressure street mains through the consumer's service pipe at any desired pressure from 1 pound up. His attractions kept him busy, and he worked willingly to satisfy all, but too hard to enjoy the convention.

A TABLE laden with attractive printed matter was presided over by L. F. Daniels, representing the Boynton Furnace Company, New York and Chicago.

SECRETARY W. EMIL KUGEMANN represented the Ideal Boiler Company of Chicago. He had a large trade-mark in colors on the wall, and an ideal boiler set up and some loose sections to show the construction and circulation. A number of their specialties in valves and regulators were also shown, attracting many visitors to the exhibit.

W. H. HAYES and G. F. HICKMOTT, representing the Hayes Mfg. Company, Paterson, N. J., showed a Wilhelmi copper range boiler, guaranteed to stand 200 pounds pressure, also a section of the boiler showing their method of bracing the boiler and connecting the parts.

J. J. RICKETT, 3948 Fifth avenue, Pittsburgh, displayed all varieties and shapes of his rubber water closet connections on an ingeniously contrived stand made of nickel plated pipe.

CHAS. A. CRIQUI of the Criqui Filter Company, St. Joseph, Mo., exhibited niokel plated samples of their germ proof filter. It can be attached to a sink or lavatory and filter all the water that passes through. The filter is an unglazed china jar, and is

said to work for several months before it needs cleaning, which can be readily doue by shutting off the water and removing the filter jar. It is cleaned by a brush, or if thickly coated fine emery paper will clean it.

G. F. HICKMOTT showed samples of the Brockton files and rasps for soft metals and woods made by Walter Cobb, Jr., Brockton, Mass. He showed one that had been in use a year that cut free and did not clog when used on lead.

SECRETARY J. E. HOLLAND had a sign, "Holland Radiator Company, New York and Chicago," hung on a column around which was grouped samples of the Holland radiator in different styles of decoration. The advantage of their method of construction and connection was explained to all.

COL. W. T. MCGURRIN of Sproul & McGurriu, dealers in plumbers' supplies, Grand Rapids, Mich., showed circulars of the Excelsior grease and sewer gas trap and the Salvage closet connection. The closet connection was shown complete, and is for repairing earthenware closets when the flush or revent horn is broken. It is very easily attached.

THE HYGEIA FILTER COMPANY, Detroit, Mich., had samples of their filter on exhibition both for use on one fixture or for filtering the water supply of a building. G. L. Benedict explaiued its operation and distributed a 12-page pamphlet showing sectional views and thoroughly explaining its advantages, coustruction, operation and method of attaching it.

EMMETT MARTIN, Fort Wayne, Ind., showed a catch basin and back water trap that received considerable attention.

JOHN COYNE, representing the Detroit Lubricator Company, showed a line of steam and hot water valves to the delegates.

W. P. POWERS of the Powers Duplex Regulator Company, Chicago, was present and showed his regulator in connection with the Ideal boiler of the Ideal Boiler Company, in charge of W. Emil Kugeman.

JAMES H. DAVIS, the Western manager of the Standard Radiator Company, Buffalo, N. Y., came from Chicago and had a Turkish rug on which he displayed the New Standard radiator in a single loop decorated with gold bronze and silver bronze ornamentation and a three-column radiator decorated in the same style. The four-column radiator had a silver bronze background and gold ornamentation. These radiators are all tested by a pressure of 75 pounds alternately of steam and cold water before shipment. The company have recently put in operation a 75-ton cupola, which doubles their output, and their orders have kept them working overtime for several weeks. Their yearly capacity will now reach ahout 3,000,000 feet of radiation.

A STEEL BATH finished in handsome style was conspicuously displayed in the exhibition hall and the printed matter of the Steel Bath Mfg. Company, Detroit, was freely distributed. The tub spoke for itself, its many advantages being readily seen by the plumbers.

A. C. JOHNSTON and F. W. Herendeen of the Herendeen Mfg. Company, Geneva, N. Y., Chicago house had a Faultless Furman boiler in the exhibitors' room. They distributed a neat leather card case containing a circular of the Furman., Jr., hot water boiler and the dimensions and ratings of the Faultless Furman steam and hot water boilers.

IN THE center of the exhibition hall, so that all who came down from the hotel could see it, a picture of the Capitol Building in a quartered oak frame was hung above the mantel with an American eagle holding the Star Spangled Banner above it. The frame bore a horseshoe in red with the words "Capitol Luck" on each side. Below, and in front of this attraction, the United States Heater Company of Detroit showed their Hecla and Mascot steam boilers and two sizes of the Capitol hot water heater. These were lighted inside by electric lights and red ribbon was used to show the passage of the products of combustion through the heater. On a table in front a display was made of the Capitol steam and hot water valves, altitude gauges and thermometers, with catalogues and circulars. The features of the rocking and dumping grate, grate surface, style of fire surface, draft flues, separating chamber and construction were explained by J. H. Bacon and A. T. Henderson, who had many interested inquirers.

THE J. H. MCLAIN COMPANY of Canton, Ohio, made a fine exhibit of their hot water and steam heaters. Five samples were shown, comprising the Harvard, Humber, Yale and Sandow for hot water and the Cambridge for steam. These were all painted white, with hands and letters gilded, making an extremely attractive showing. For the purpose of showing their interior construction an incandescent electric light with a long wire was available, which was in almost constant use when any plumbers were near, as everybody desired to see how fire pots looked and how circulation was provided for. A brand new catalogue, elegantly gotten up, was distributed on this occasion. C. B. Matteson was in charge of the exhibit and presented each caller with a morocco bound memorandum book as a souvenir.

IN PARLOR M, J. E. Zimmerman had a fine display of flush tanks in a variety of styles and shapes, and water closets, with a line of plumbers' brass specialties and the Ideal easy packed quick opening radiator valves.

CIRCULARS were distributed by W. A. Kelly, Cleveland, Ohio, of the Electric water closet, which was set up for inspection in operation at the Detroit Lead Works, not far away.

WM. KERR, Cleveland, Ohio, showed samples of a patent sink and basin trap that is a good grease trap and is sealed by a ball when the water seal is broken.

H. A. DESPER, Worcester, Mass., showed a soil pipe testing valve that is just the thing, and Balsago is a material that is said to make soil pipe air and water tight.

E. C. MILLER showed a variety of soil pipe fittings made by the Perfection Cleanout Company, Haverhill, Mass., every one showing how their Perfection cleanout is used on L's, Y's, one-quarter and one-eighth bends, traps and double hubs. He also showed the Perfection roof collar, with which a tight connection can be made.

H. B. STOCKWELL represented Charles Royle, Brooklyn, and Wm. Foerster & Co., New York, and showed a handsome line of brass gas fixtures and glass globes.

THE HYGIENE GAS STOVE COMPANY, Pittsburgh, showed a gas stove adapted either for cooking or for heating soldering coppers or melting solder in the metal pot.

THE INSTANTANEOUS WATER HEATING COMPANY, Chicago, had a sign 5 feet square above their exhibit which had a black velvet background with their water heater setting above a bathtub in bas-relief made of silver plated sheet metal. The name and the addresses of the company in New York and San Francisco and in Manchester, England, Brussels, Belgium and Paris were made of silver plated letters, as also the legends "Eight Years' Test" and "You Light a Match, the Heater Does the Rest." The Douglas No. 2 and No. 3 water heaters were shown in planished copper and a nickel plated Sectional No. 2 was on exhibition to show the operation. Three new heaters were shown for the first time under the name Acme. The No. 9 is adapted for boiling water, and is fitted with a shower and thermometer when required. The No. 7 is adapted for bar and restaurant use. The No. 6 is made for doctors, dentists and barbers. All of the Acme heaters are designed for connection with the water service pipe of a building. The Perfect gas controller, in scarlet paint and gilt lettering, made by the Brownhill Company, Chicago, was shown in connection with this exhibit. It is designed to automatically control excessive pressure, and testimonials in the circular speak of a saving of 15 to 40 per cent. in gas bills.

THE AMERICAN RADIATOR COMPANY, Chicago, were well represented by Clarence Wooley, who recently returned from a visit among the trade ahroad, and he speaks highly of the reception given him. He was assisted hy Sam Hopper, Charley Foster, S. K. Pitman, Clarence Carpenter, Ed. W. Sumner and John B. Dyar. The new Detroit flue radiator was the center of attraction, and is a handsome sample of the Renaissance style of ornamentation. It rested on their latest window radiator, and was surrounded hy the plain fluted National, Detroit, Detroit direct-indirect Ideal and Perfection radiators. They were decorated in rose, olive, oxidized silver, chocolate, copper and gilt with the relief portions in tints.

THE KNIGHTS OF TABASCO were everywhere at the right time and are very popular. President Finnerty said their good fellowship entitled them to the right of the line in the parade, but with becomiug modesty they brought up the rear, carrying umbrellas with red ribbon streaming from the ferrule, and marched with precision to the music of their hand, led by Old Pepper T. J. Cushing, and marshaled by the other Peppers. They went through a very pleasiug drill in opening and closing the umbrellas and keeping time to the music with them.

NICK SPANG detected an old plumber's helper that he knew, and invited to join him in guarding the rear of the Knights of Tahasco as they marched.

LOUIS W. GAY, one of the "Peppers," is an engineers' supply man from Buffalo.

GEO. L. BOTTUM, the general agent of the John Douglas Company and the Lausten Lead Works, Chicago, is both "hot stuff" and an all around plumbers' supply man.

CHARLES S. SIDDONS, Buffalo, N. Y., representing the Buich & Sherwood Mfg. Company, Detroit, and their Success tanks and seats, says he is lost in Detroit, the East heing his field. Little Charley is one of the "hot stuffs."

OLD PEPPER T. F. CUSHING, representing the John Simmons Company, New York, pipe fittings and brass goods, took T. J. Cusack, a Kingston, N. Y., plumber, out for a drive to see tde city.

G. W. YOUNG of the Standard Mfg. Company, Pittsburgh, Pa., dropped enameled baths and plumbers' goods and worked for the Knights of Tabasco

THIS was the first opportunity for the Western salesmen to join the Knights of Tabasco, and 100 new members shows its popularity.

E. F. ACKARD, treasurer of the Saginaw Hardware Company, was a delegate from Saginaw and envies a Knight of Tabasco his honor.

THE KNIGHTS of TABASCO, led by A. E. Hyde, entertained all on the moonlight excursion hy their vocal music. The boys are use to telling sweet stories in perfect harmony.

THE PORTERS at the Cadillac were told to watch for any one that had two pairs of shoes on, as one prominent Connecticut plumber lost his, which seems rather strange, too.

THE RICHMOND STOVE COMPANY, Norwich, Conn., were well represented by Thomas J. Douglas, a Tabasco Knight, who made an occasional remark on Richmond Sectional and Victor steam and hot water goods.

"JIM" SMITH was the way he was known to the Tabascos, but to the trade he represents the A. Harvey's Sons Mfg. Company, Detroit, steam, gas and plumbing goods and heating apparatus.

T. F. KELLY of the L. Wolff Mfg. Company, Chicago, is a good dancer, and as popular with the ladies as he and his liue of goods are with the plumbers. He is so genial that without his badge he would not be known as "hot stuff."

JOS. E. LEE, who assisted the ladies' entertainiug committees, drove the writer around among the hotels to see the ladies

who had arrived, in order to make proper arrangements for their amusement. The work is better than either plumbiug or newspaper work.

A HORSE CHESTNUT suspended from a red ribbon was a unique reminder of the presence of the Buckeye State plumbers.

WHEN the parade passed the office of the Cleveland Faucet Company their front was filled with their people, who cheered a welcome.

"HAHNE & CO., Steam and Hot Water Heating," was what the lettering on the show windows said, but a fine display of modern plumbing fixtures was what appeared as the parade passed.

"ALL TO THE FRONT" must have been the order when the parade passed the headquarters of the James B. Tufts Company, Boston, for their door was filled and a merry welcome shouted.

ALLEN BLACK came alone to represent St. Paul, Minn., and if the plumbers at home knew of the reception that awaited him he would have had plenty of company.

JOHN A. KRAMER, 912 North Third street, Harrisburg, Pa., makes a specialty of steam and hot water heating in addition to plumbing.

ALEXANDER DON, Newark, N. J., is a steam and hot water heating man who can show a number of successful jobs in fine residences.

C. H. KRANICHFELD of the New York City delegation, though from the neighborhood of the late "Mother" Maudlebaum, Rivington street, is a sound theologian, as John Michell's partner, friend McMein, can testify.

AS HAPPY a gentleman as attended the convention was Geo. P. Kirtley of Kirtley Bros., sanitary and contracting engineers, Kansas City, Mo.

THE TRADE MARK of the Kennedy Valve Mfg. Company, New York, in red ink, adorned the card presented by Charles P. F. Cushing, who can talk business in a very entertaining manner.

J. N. GLAUBER and ALEX. M. BUCHMAN represented the Glauber Brass Mfg. Company, Cleveland, Ohio, and they did not "stop and waste" any time, but were alive to all that was transpiring. They had a large sign hung across the entrance to the exhibitors' room showing a picture of a Glauber stop and waste with the name of the company, their specialities and words of welcome.

THE A. A. GRIFFING IRON COMPANY, Jersey City, N. J., could have no more acceptable representatives at a convention than their Western manager, Frank E. Somers, and M. H. Houghtaling from the Chicago house. The Bundy radiators will not be forgotten or held in low esteem after meeting them.

THAT GOOD GOODS come in small packages is true, as any delegate can testify of J. K. Finney, who represents ably the L. M. Rumsey Mfg. Company of St. Louis. His manners are like the brass goods of his house, highly polished and the genuine article.

"SANITARY SPECIALTIES, Brass Pumps and Plumbers' Supplies Manufactured by the Henry Huber Company, New York," was on the cards presented to every delegate by John Emig.

D. T. RODGER of 11 Lafayette avenue, Detroit, makes a specialty of steam and hot water heating in addition to plumbing.

A. B. PIERCE was greeted on every side by friends who know him and the line of plumbers' brass goods made by his house, the N. O. Nelson Mfg. Company of St. Louis.

CHAS. I. HOBKIRK talked the improved Rider and Ericsson hot air pumping engine in the interest of Delamater Iron Works, 87 South Fifth avenue, New York.

JOHN HICKMAN, President of the Paterson, N. J., association, and Samuel L. Malcolmson of the New York delegation, visited the Order of Chosen Friends and made speeches.

BERTRAM represented Wichita, Kau., and thoroughly eujoyed meeting plumbers from all over the country.

PRESIDENT HENRY P. COPE and J. E. ZIMMERMAN of the Ideal Mfg. Company, Detroit, whose trade-mark is a triangle with their name in it amid a cloud and with rays shooting from it, distributed "A reserved seat at tho Cadillac." It was a little book devoted to their Ideal seats. The card they presented spoke of the Ideal lines of seats, tanks, valves, hose rcels, iron toys and novelties.

N. HAAS of West Bay City was proud of belonging to the first association formed in the State of Michigan.

IN THE MATTER of badges the delegates to this convention had endeavored to outshine any of their previous efforts, and they succeeded admirably. Much originality was displayed in designs, and many were exceedingly artistic, worthy of being preserved as souvenirs of the occasion.

THE Chicago delegation traveled in its own train to Detroit, by way of the Wabash Railroad. The special left Chicago at 10.25 on Monday morning and arrived at its destination at 5.10 in the afternoon, making a remarkably quick run. The delegation was a large one and was swelled by considerable additions from other parts of Illinois and States further west, as well as a goodly number of ladies. Plenty of room had been provided, however, and the trip was made exceedingly pleasant by the unremitting attentions of the railroad officials, supplemented by the watchful care of the Committee of Arrangements of the Chicago Master Plumbers' Association. The rapidity of this journey would nevertheless have been an unpleasant feature if it had not been for the very smooth roadbed and well kept rolling stock of the Wabash Railroad.

TREASURER W. E. GOODMAN when presented to President Elias Berla and Secretary Alexander Don of Newark, N. J., and President John Hickman and Levi McBride of Paterson, N. J., said: "I am glad to meet representatives of a good State, and expect to hear of increasing associations with such men to work for the cause."

THE FOLLOWING letter was inclosed in an envelope with a neat calf bound memorandum book, having celluloid mosaics showing cuts of the gas machine and the hot water heater made by the Detroit Heating & Lighting Company: "Extending to you, as one of the delegates to the twelfth annual convention of the National Master Plumbers' Association, our best wishes, we herewith inclose a slight memento, which we trust will serve in the future as a pleasant reminder of your visit to the beautiful little 'City of the Straits.' We trust that the first memorandum entered in the book will be the date upon which you will favor our factory with a call during your stay here. We can assure you your call will be appreciated, and you will find us at home."

A HANDSOME vest pocket memorandum book was distributed among the delegates with the compliments of the Maryland Pottery Company, Baltimore, Md. Their trade mark, composed of their name and address and the word "Heath" used four times arranged as a diamond around their monogram with the words "Vitreous China" beneath, was printed in a tinted ink in the middle of each page. At the top and bottom of the page in red ink brief sentences extolled the merit of their sanitary vitreous china goods. They also distributed a little book on the qualities aud defects of sanitary earthenware and the superiority of vitreous china. Secretary M. J. Brown, Jr, and John H. D. Rowan were in charge of their exhibit of front and back washout and siphon closets, plain and decorated, with and without vent and right and left haud, lavatories round and oval and urinals. Vitreous china is claimed to be a hard, vitrified, non-absorbent material, impervious to all deleterious matter, that positively will not craze or fall to pieces from "wet rot." In the manufacture a temperature is carried that is said to be 50 per cent. higher than is required with ordinary ware, and the goods are fired for more than twice the usual time in order to endow them with the superiority that is claimed for them.

WM PALMER, representing the American Tube Works, Boston, Mass., distributed a catalogue giving a list of sizes, weights and strengths of seamless drawn brass pipe for plumbers among the delegates. It contained the names of prominent plumbers who have used the pipe and the buildings where it is used. The delegates say that brass pipe is coming into more general use.

THE MASTER PLUMBERS OF WORCESTER, Mass, value membership in their association at a good stiff figure. Their initiation fee is $250. They report that they have consequently received only good material in their local association, the interest taken in its proceedings being so intense that they very seldom have any absentees from the regular meetings.

FRANK DU BOIS, representing Du Bois & Darrow, the newest plumbers' supply house in New York, visited some of the manufacturers in the city whose goods they are the Eastern agents for.

W. B. HUBBARD, representing Peck Bros. Company, New Haven, Conn., and his wife were the guests of the delegation from Boston and vicinity.

A REPRESENTATIVE of the Oster Mfg. Company, Cleveland, distributed circulars of their patent adjustable die stock, which does not need to be unscrewed to remove after the thread is cut on the pipe.

MARK E. MONASK represented the Van Auken Steam Specialty Company, Chicago, and all the delegates received his card.

THE PERSUASIVE ELOQUENCE of John Mitchell of New York was never heard to better advantage than on Tuesday afternoon, when he championed the cause of the delegates from the State Association of Michigan. In polished phrase and with fine oratorical effect he pleaded for the larger representation for Michigan, and if the way had been clear would no doubt have carried his point with ease. But the law, as laid down in the constitution, prescribed a different course for the association and his magnificent effort was put forth to no effect.

THE EXCURSION on the Detroit River on Tuesday evening was a very enjoyable event. The pleasure steamer "Promise" was crowded with plumbers and their friends, their wives and their sweethearts. A large dancing floor formed part of the steamer's accommodations and it proved a constant attraction to the excursionists. The weather was apparently made to order for the occasion and could not have been better. The fine harbor and the exquisite panorama of the water front along Detroit and Windsor excited the enthusiasm of the visitors.

A VERY ACCEPTABLE SOUVENIR was distributed by the Mouat Heater Company of Detroit. It was a hard rubber paper cutter and envelope opener of just the shape and pattern to do the work satisfactorily. The company also presented the members of the convention with copies of their latest catalogue, a handsome publication of 36 pages, devoted solely to hot water heating. The several styles of heaters made by this company are illustrated in sectional and perspective cuts, and their special points of merit are fully set forth.

JOHN B. SMITH, Lewiston, Maine, sported a cane presented at the Water Works Convention, at Boston last week, by the Ross Valve Company, Troy. The handle was an aluminum valve.

THE "CLEAN SWEEP MAN" was the way A. C. Cogswell was generally known. He represented the Detroit Sanitary Supply Company, Detroit, makers of the Clean

Sweep non-siphon sewer gas trap and sanitary specialties.

FRED. J. STROEBEL, representing the Royal line of steam and hot water boilers and hot air furnaces, made by Hart & Crouse, Utica, N. Y., was at home among the plumbers. He put both steam and hot water catalogues on every seat at the convention hall on Wednesday and they received no little attention.

THE SIOUX CITY, IOWA, delegation wore a pin to hold their badges representing a hog resting on an ear of corn as emblematic of one of the industries of the Hawkeye State.

"WHAT CONGRESS HAS DONE," was a book of empty pages given by the Niagara Radiator Company, Buffalo, N. Y., written by their manager and distributed by Frank C. Perew and F. G. Haywood.

C. BIRKERY of the Birkery Mfg. Company, Hartford, Conn., and O. H. Jones distributed a very neat vest pocket match case showing a cut of the Birkery ball cock, under which was "There is no match for the Birkery."

JOHN L. E. FIRMIN, San Francisco., Cal., is one of the well known men at the conventions. He was with bachelor John Crimmins of Los Angeles, Cal.

"IT LOOKS IMPOSSIBLE BUT IT CAN BE DONE," caused a search for the coins to be passed through the hole in a cardboard problem given out by the Herendeen Mfg. Company, Geneva, N. Y., which also spoke of the Faultless Furman boilers.

"GOOD CENTS AND DOLLARS buy the Dunning boilers for steam and hot water heating, made by the New York Central Iron Works Compauy, Geneva, N. Y.," was on a neat coin purse distributed by C. H. Williams, who was everywhere that the plumbers went and always genial.

M. A. DUNNING was one of the delegates of the Northwestern M. P. A. who is a hardwareman and a heating engineer as well as a sanitary specialist.

MISS JENNIE H. MIDDLEBROOK, daughter of Major Middlebrook of Bridgeport, Conn., was the designer of the badge worn by that delegation, and "handsome is as handsome does" is indisputable in this case. She enjoys the distinction of being the only woman to hold office in her city, being the assistant town clerk.

MASTER WILLIE WATTS, Louisville, Ky., was the youngest plumber at the convention.

TUESDAY AFTERNOON the ladies were surprised by a fine lunch provided by the Buick & Sherwood Mfg. Company of the city of Belle Isle, where the group was photographed and the ladies left their addresses so that a copy could be sent to them. This was a very pleasing feature of the drive.

C. H. KALVELAGE, representing the Hoffman & Billings Mfg. Company, Milwaukee left plumbers' and steam fitters' supply talk at home and enjoyed the geniality that was a feature of the convention.

S. RESEK, representing the Farnan Brass Works, Cleveland, Ohio, was always in sight when either fun or business was going on.

A. E. SMITH, representing the Vulcan Company of New York, showed their gasoline torch and as a result sold a large number, and circulars of it were in demand.

J. P. NEWERBERG of Reich & Neuer berg, 862 North Halsted street, Chicago, was one of the active representatives of the fraternity.

JOSEPH NEIL, West Superior, Wis., said that the warmth of the greetings at every hand reminded him of good solder at the right heat for wiping.

THERE were few strangers to H. S. Van Volkenburgh, who did not let the interests of the improved Bolton hot water heater suffer, as the Nashville Machine Company, Nashville, Tenn., will appreciate later.

JOSEPH RICE, 653 Third avenue, Pittsburgh, was shown the points of interest in the city by J. B. Lawler, a Detroit journeyman plumber who learned his trade in Pittsburgh.

JAMES W. PARTLAND, East Congress street, Detroit, has recently completed a very handsome sample room with marble trimmings and has lavatories, baths, water closets, sinks and laundry tubs set up in the best of style and was just finishing the lettering on a very hansome sign in colors and gilt on his plate glass show windows in honor of the convention.

FRANK WALSH, 45 West Congress street, Detroit, made a fine show of plumbing goods in his window and set an example worthy of being followed in having blooming plants and vines arranged to relieve the effect. He may not be to blame for it, as he is quite a horse lover and a young lady presides over the office, another worthy example. A drive with Mr. Walsh is very pleasant.

JAMES F. TRAYNOR of Wilmington was the sole representative from Delaware, but the blue hen's chicken can scratch for the brood. He does steam and hot water heating and has a $20,000 contract on hand.

THE NIAGARA RADIATOR COMPANY, Buffalo, N. Y., displayed four of the Niagara radiators on a Persian rug. These radiators are of the rococco design and were of different hights and ornamented with silver and gold bronze on green, brown, olive and cream colored grounds. These radiators are all prime surface and are of the flue construction with ample air space. The waterways are designed to facilitate circulation and the end sections being solid they present a neat appearance. The central sections are of the three-column style. They attracted many observers, and their merits were explained by Secretary Perew and F. G. Heywood, the Western manager, who came over from Chicago to meet his old friends.

JOHN HICKMAN, president of the Paterson, N. J., Master Plumbers' Association, showed the "G. & V." plumbers' pipe clamp made by Gardenier & Vermenlen of his city, and distributed circulars showing their use and advantages. The helper don't have to hunt for bricks to hold the pipe or brass work when a set of these clamps are in the tool bag.

T. H. HUZE aud V. M. WELLMAN just suggested that sanitary specialties could be had by applying to the C. F. Hunger Company, Cleveland, Ohio.

THE DAVIS HOT WATER COMPANY, Racine, Wis., put a circular of the gas hot water heater for domestic use on every chair in the convention hall.

T. F. CASSIDY, inventor of the Champion clamp machine, sold by C. A. Bray, Boston, Mass., showed how straps for 68 sizes of lead pipe could be made from brass strips with this machine cheaper than tacks could be used. Continuous straps, hangers and washers for marble work can be made quickly.

OVER 600 patent Magic basin clamps were distributed by the Glauber Mfg. Company, Cleveland. They will fit any basin, and having a brass spring hold it tight and do not break the pottery.

AT THE Ben Hur farm a Philadelphia hopper closet is used for a flower pot, and nevertheless fragrancy is one of its features. It is mounted on a tree stump.

J. H. MUELLER let the delegates know that the Crane Company, Chicago, ranked in front as a plumbers' supply house.

NEW JERSEY was ably represented by her delegation, and much interest was taken in an impromptu meeting held by them at the Hotel Cadillac with the view to forming a State delegation. The national officers expressed their willingness to lend any assistance possible to this end. Alexander Don of Newark and John Hickman of Paterson can furnish information as to the plan of proceeding, and it is hoped that sufficient interest will be taken by those who do plumbing work to warrant the call of the craft at some point on the seashore in the near future.

IF ANYBODY'S JOB has not been properly done it is because our helper did not have his pads and joints ready for use.

A Solid Delegation.

New York City sent her full complement of 37 delegates to the convention of the National Association of Master Plumbers at Detroit and they were accompanied by the Paterson, N. J., and the Bridgeport, Conn., delegates. The ladies with the party were Mrs. Yule, Mrs. Cameron, Mrs. Blace, Mrs. Delacy, Mrs. Pattison, Mrs. Mitchell, Mrs. Rossman and Miss Byrn of New York, Mrs. Green, Miss Green and Miss Middlebrook of Bridgeport, Conn., and Mrs. Page of Naugatuck, Conn. Through the untiring efforts of John Yule two cars were chartered and ample refreshments were provided for the journey. Mr. Yule made his arrangement with the West Shore Railroad and induced Chas. S. Andrews, the passenger agent for the West Shore route, to travel with the delegation and look after their comfort. As a result Mr. Andrews selected his stopping places and arranged for inviting repasts with ample time for their enjoyment.

A floral horseshoe made of sweet peas, with the letter "P" made of pinks, surrounded by white tuberoses, was sent the delegation with the best wishes of the Henry McShane Mfg. Company, 624 Sixth avenue, New York. In addition they presented each of the travelers with an individual souvenir "Wishing you a safe passage" that met with a merry reception. Mr. Andrews arranged for stopping over at Niagara Falls for a later train and the privilege was accepted by several of the ladies and their escorts.

Hotel Cadillac was reached after a day amid beautiful scenery and a ride for some miles along the lake. After a little delay owing to the demand for rooms all were comfortably quartered and later presented a refreshed appearance in the beautiful dining room of the hotel for tea.

The Knights of Tabasco.

The meeting of the Knights of Tabasco was called to order on Monday night by D. M. Davidson, "Young Pepper," in the absence of Old Pepper T. F. Cushing, who later assumed the chair and made an address on the objects of the association that was to the point and brief, but courteous. The applications of 49 new members were received and the president announced their election with the remark that they would be initiated into the mysteries of the society later.

The following elect are on the anxious bench wondering how "hot" the "stuff" that is to be applied to them will be: Samuel Clark, Thomas J. Douglas, A. C. Cogswell, J. H. Davis, G. F. Hickmott, J. A. Rathbone, C. A. Miller, J. A. Smith, Nicholas Spang, C. J. Johnston, William Palmer, J. E. Zimmerman, G. L. Bottum, C. H. Muchenhirn, M. J. Cohen, P. E. MacDonald, E. D. Babcock, W. H. Hayes, R. M. Dorsey, C. Cushing, D. D. Brick, J. K. Soultz, W. B. Hubbard, John H. D. Rowan, M. J. Brown, Jr., R. Rom, S. E. Little, G. Young, A. M. Buchman, W.

H. Castlen, F. W. Somers, A. E. Hyde, Henry P. Cope, W. H. Morse, J. E. McClain, James F. Meager, H. B. Houghtaling, M. T. Whitney, Chas. A. Crique, F. B. Haywood, J. E. Holland, Fred. Holme, W. Emil Kugeman, R. M. Hooker, G. W. Cope, Frank K. Claw, G. W. Benson, H. B. Auger, M. Sullivan and Augustus Holmes.

On motion the Knights accepted the position in the line assigned them in the master plumbers' parade. On motion all were ordered to carry umbrellas with red ribbon streamers. "Old Pepper" stated that a band had been hired for the occasion and the knights adjourned to meet at 8.30 a.m. Tuesday.

Second Meeting of the Knights.

Word was sent along the line to assemble in the parlor for the initiation at 1.30 p.m., Wednesday, and a full attendance was the result. The Knights passed through the ordeal of initiation in the presence of the other candidates, as it was impossible to handle so large a body, there being 59 new members enrolled up to date.

The candidates were selected, and the initiation would make interesting reading, but it is the only good thing that a salesman has which he does not share generally with his trade, consequently the mystery must be preserved.

On opening the meeting the roll was called. "Young Pepper" then addressed "Old Pepper," and read a communication from the National Association of Master Plumbers, which said that a long session would prevent them from escorting their ladies to excursion steamer to the Ben Hur farm, and requested that the Knights of Tabasco perform that duty for them, which was greeted with cheers. On motion the initiation ceremonies were dispensed with in order to comply with the request.

"Old Pepper" appointed G. W. Young, E. G. Pond, J. E. Zimmerman, D. M. Davids, T. F. Cushing and C. H. Muchenhirn as chairmen to select their own committees and to wait upon the ladies at the Russell, Ste. Claire, Wayne, Normandie, Cadillac and Barclay hotels. The meeting adjourned to meet at the call of the chair to proceed with the initiation ceremonies, and announced that the meeting would be called on the return from the excursion.

Tabasco Refrain.

Who stole my gold watch and chain?
You did.
Who brought it back to me again?
He did.
Who drank all my sparkling wine?
I did.
Who showed the very finest line?
All did.
Who on hard work seemed to thrive?
They did.
Who ever saw men more alive?
I did! You did? No! he did!
Who did? The man who died because he did.

The Ladies.

This year was notable for the attendance of the ladies and the most elaborate floral decorations lost their sweetness and beauty by comparion.

New York was represented by Mrs. Mitchell, Yale, Blace, Cameron, Delacy, Rossman, Pattison, and Miss Byrns.

Chicago by Mrs. Redieske, Breyer, Culloton, Boland, Doyle, Boyd, Sanders, Herbert, Mandable, Conway, Deveney, Cummins, Hickey, Murphy, Wade and Verity.

St. Louis by Mrs. Sheehan, Lonergan, Quinn, Carrol, and Misses Madden and Crim.

Pittsburgh by Mrs. Gray, McCullough, Blythe, Addy, Cowling, McKnight, Bradshaw, and Misses Alice Pitfield, Annie McKenna and Kittie McKenna.

Louisville by Mrs. Duffy, Watts, Ramsey, Matlack, Shulhafer, and Miss Bessie Shulhafer.

Buffalo by Mrs. Stygal, Mensch and Yohl.

Boston, Mrs. Hartnett, Smith.

Lewiston, Maine, Mrs. Smith.

Harrisburg, Pa., Mrs. Kramer.

Saginaw, Mich., Mrs. Merrill.

Brooklyn by Mrs. MacDonald, Lewis, and Miss Lewis.

Naugatuck, Conn., Mrs. Page.

Bridgeport, Conn., Mrs. Green, and Misses Green and Middlebrook.

The Reception Committee of the Detroit ladies, with Mrs. Comstock for president, was composed of the following: Hotel Cadillac, Mrs. Toll, Kramer, Gulney, and Misses Gulney, Crumley, Sheehey, Lennane, Hull, Burton, and Geo. W. Dennis and Melvin Elliott; Russell House, Mrs. Reid and Burton, and Misses Steiner, Walsh and Lee, and Joseph Doyle and David Reid; Hotel St. Claire, Mrs. Walsh and Drury, and Misses Frumvieller, Kramer, Halloran. Hatzenbauler, Giefel and Larkins and Joe E Lee and Harry Wyman; Hotel Normandie, Mrs. Barbier and Bolt, and Misses Meathe, Kramer and Gulney, and James Cameron and Geo. Williams; Hotel Wayne, Mrs. McFadden, and Misses Meathe, Steiner and Cullen, and A. W. Barbier and A. D. Babcock. The Miscellaneous Committee was Mrs. Kenealey, Morris and Sullivan, and Misses McKerchey, Nills, McKay and Maber.

On Tuesday at 2 p.m. the ladies were taken on a drive to Belle Island and a moonlight ride on the river in the evening. On Wednesday at 4 p.m. to a supper at the "Ben Hur" farm at Walkerville. On Thursday afternoon a carriage ride. Friday 8 a.m., an excursion up the river and a fish dinner at the Oakland House.

Organization.*

BY J. SHEEHAN.

In presenting this paper I beg your indulgence in reiterating our experience as a master plumbers' association, and offering a few suggestions on the subject of "The best plan for the organization of master plumbers' associations and the proper limit of their action," as I know of no better way of making the subject clear than to speak from actual experience. It is a subject requiring much careful thought, inasmuch as it is to be criticized by you, and, if your judgment be favorable, to be referred to the constituent bodies of our national association that have organized and are enjoying the resultant benefits of wise, conservative government, whose opinions and experiences regarding the proper scope of associated effort may differ from ours, and also go before those master plumbers who have not united in inaugurating needed reforms. To the latter this essay is respectfully submitted, and should a review of our experiences and hopes be the means of awakening a consciousness of their responsibility by pointing out lost advantages and gains to be secured through organization, the writer will feel amply rewarded.

OBJECTS OF ORGANIZATION.

The discouraging condition of the plumbing business previous to the inception of our organization actuated us to form ourselves into an association in order to correct existing abuses, maintain our rights as honorable craftsmen, elevate our vocation to a point where from mere struggling mechanics we should be professional sanitarians, and by reason of our ability win the confidence of the public. The motive of the association is to unite upon a comprehensive plan, as many as possible, for a threefold purpose: 1, of obtaining the wisest judgment; 2, the greatest strength, and, 3, the most complete uniformity of action; and in our associated efforts we have been most successful. We have convinced our patrons that we are not the "awful plumber" whom the newspaper scribes take such delight in illustrating and writing about. Our methods are honorable and our bills fair, as they should be for good work. aud are only commensurate with our efforts and the time we have spent in perfecting ourselves in the art of protecting the health of the people We have also convinced manufacturers and jobbers of the correlation of our interests, and the journeymeu that our interests and theirs are so closely allied that we cannot afford to be inimical iu our relations.

MEMBERSHIP.

Who are eligible to membership? At the inception of the association we desired strength in numbers as well as quality of members; but we, the St. Louis Association, have now become strong enough to name the qualifications for membership. Twelve years ago the required qualifications for master plumbers were not necessarily as rigid as to-day, for we have made great advances in sanitation and mauy new and complicated appliances are now on the market, making it necessary that the progressive master plumber should have a more extended knowledge. In launching our association we found it necessary to open wide the door and extend a pressing invitation to every master plumber to unite with us in elevating and protecting the trade. In so doing we admitted aspirants whose credulity and ignorance led them to believe in the alleged plumber's profits, and that there was no easier road to wealth than by the plumbing business. But, alas! for their mistaken ideas. How they would have fared had it not been for the fostering care of the association they can attest. We realized the existence of poor workmen; that they were in the business with money invested, not much, perhaps, and that the best and only way to eradicate the evil was to educate them by example and contact. That we met with difficulties at the outset is evident, but we have demonstrated its feasibility to a sufficient extent to warrant us in recommending to associations that wish to perfect further the conditions of the business not to be too loud in condemning the practices of their neighboring craftsmen who may, by reason of their lack of favorably located and well stocked stores, gain the ear of the public and elicit sympathy iu their favor, but rather educate and encourage them to more honorable methods. Well directed effort in this direction will in time eradicate poor work and do away with the disagreeable and dishonorable competition with cheap labor and poor work, for they generally go hand in hand. The success of this alone will more than pay for the time spent in its interest.

INVITATION TO MASTER PLUMBERS.

Master plumbers' associations are not formed for coercion or monopoly; therefore we should invite all worthy master plumbers to affiliate with us—that is, master plumbers who are conducting a creditable business. As it is the duty of every citizen to support the government which protects his life and property, so it is the duty of every master plumber to support the association that has his interests at heart. If a worthy journeyman plumber desires to start for himself, though he may have been in our employment and by leaving us become our competitor, we should lend him a helping hand. For were we not once journeymen plumbers? Encourage him to strict business methods; teach him to reason that a moderate amount of good work at fair prices is more profitable than much work taken where the stock is furnished at cost and delivered gratis, so that people will see your wagon around town, and labor underestimated and poorly performed in order to get out whole and that a desirable business cannot be built up in this way. This will make competition less harassing.

As to those in business who will not associate with us, rather than attempt to force them into the association or out of business (both being very annoying and generally impossible, and which cause the public to look upon us with suspicion), let us conduct our business and association affairs in such a manner as to make them ashamed of their position, and then the public will look upon them as unwilling to unite in honorable

* Essay presented at the Detroit convention of the National Association of Master Plumbers, June 19-21, 1894.

competition and lend their influence in the furtherance of sanitary legislation for the protection of public health.

SELECTION OF OFFICERS.

The first and all-important factor necessary at the formation to insure the successful working of the association is the selection of cool headed officers—but not so conservative as to be timid in standing up for principle. The officers should be those who are known to the public and to their colleagues as straightforward business men and leaders in the profession, for it is essential that the initial efforts should be espoused and advanced by the best men. It is not always necessary that they should be the old heads, as the saying is, for we have a young element equally well qualified and interested in the welfare of the craft. It is also important that the officers should by their example lead in the good work rather than follow in the rear, as if they were on the battle field; for our position may be likened to a battle field, as we have to combat public opinion, which is naturally hostile to associated effort on the part of workmen or employers, no matter how well directed the effort may be. Wise and dauntless generals command the respect of their followers and the admiration of the foe. After organization and selection of officers it is incumbent upon every member to give the officers their support, for unless they enjoy the confidence of the members, and *vice versa*, but little can be accomplished. It is also necessary that the members be true one to the other—that is, faithful to the rules adopted by the association, which, however, should not be too radical.

An association and its members should not start out with the idea that the conditions which they desire to modify and which have secured a foothold through many years of neglect can be substantially reformed in too short a time, for considerable labor must be devoted to pulling up the rank weeds which have attained unheeded such luxuriant growth.

An association is what the members make it. If the members are unmindful of their own interests and the duty they owe to their brethreu and are apparently satisfied with struggling along, making no headway, or being dissatisfied, are unwilling to sacrifice as much to right the wrong as they are to grumble and quarrel, the association will be of little benefit. "United we stand, divided we fall," is a trite maxim which should not be lost sight of.

BENEFITS DERIVED.

To obtain the greatest possible benefit from organization you must enter into it with due regard for the rights of others; with a determination to be honorable in all your dealings; a willingness to sacrifice a little, if necessary, to maintain the principles of the organization. To do this your dealings must be of a nature to inspire confidence, for if it were not for the confidence existing in the business world, business would be paralyzed.

Cast aside petty jealousies. It is said that plumbers are suspiciously jealous of one another. This was true before organization and exists now to a certain extent. We read in oue of our trade papers a beautiful illustration of the brotherly feeling existing between master plumbers today. In one of our Eastern cities a time honored member was about to take his leave for a short visit to his native land, across the Atlantic, and his association tendered him a complimentary dinner on the eve of his departure, speaking words of love, wishing him *bon voyage* and safe return. Who ever heard of plumbers banqueting a brother plumber 12 years ago? If an association accomplished nothing more than to create such a friendly feeling it has done much. It is the true foundation and secret of success.

Members sometimes become lukewarm in attending meetings; sometimes because everything is going along nicely and nothing comes up to oppose them. If you do not attend, what assurance have you that some scheme is not being concocted which may be contrary to the best interests of the trade? Others become lukewarm because the association or some individual does not think exactly as they do. But did you ever stop to think that your association might be in the right and you in the wrong? Oh, no! Submit gracefully to the majority when the majority is right, which it is quite apt to be.

HOW TO INCREASE INTEREST.

To increase interest arrange for discussions on themes of interest to the trade. The association should be the means of disseminatiug valuable information relative to the best methods of doing work; proper sanitary laws. Information that Mr. Deadbeat, not many miles away, owes you for work performed last spring and that he needs to be watched, would be the means of saving considerable work and trouble, all for nothing. A good way to bring members out is to entice them with a light lunch and a smoke. A moderate collation is inexpensive and money well spent, for which each member may have an opportunity to receive his full share if he will only avail himself of the chance. Such meetings have not only a resulting monetary value, but a social value which should not be lost sight of when summing up the good of your association.

The object of joining so many members in one common purpose is to give power that could never result from the spasmodic action of iudividuals acting separately. This power should be utilized along the line of harmonizing relations and formulating desirable agreements with manufacturers and dealers in supplies relative to selling outside of the trade; promoting better relations with journeymen, and securing proper sanitary laws in the interest of public health.

METHODS OF BUSINESS.

That the master plumbers are justly entitled to the profits accruing from the material used is too well established to require comment. The dealers throughout the country, almost without exception, recognize that it is just to the plumber and beneficial to their interests as jobbers to deal exclusively with the trade. Did this idea of justice and protection originate with individuals acting unitedly? Hardly. It was through organization, without which all efforts would be futile. The jobbers, recognizing the justice of our position, also recognize that where no association exists the plumbers are apparently satisfied with existing conditions and act accordingly. If you are not satisfied, it only remains for you to do as we have done—organize and receive the most complete protection of any association in the country.

Do not presume that you can secure protection gratuitously; it ought not to be asked, and much less expected, that supply houses will protect you in the sale of goods unless you can offer some inducement in return, rather than compulsion. I regret that it is the prevailing custom among some master plumbers to substitute one manufacturer's goods for another's. I now refer to manufacturers who protect us. You figure on a job where a certain line of goods are called for, and, perhaps, secure the contract. You are a little partial to a certain manufacturer for various reasons. He may have befriended you some time and it is natural for you to do him a good turn, and which is very honorable if you can speak in behalf of his goods before any are specified; but after you have contracted to put in another manufacturer's goods and then go to the owner and say: "Smith's closets and tubs are very good, but Jones' are equally as good. I have used a great many of his goods and they have always given entire satisfaction, as I am sure they will in your case, and I will give you a good job. You see, I have been dealing with Jones for a number of years and of course I feel partial to his goods, not that they are any better, simply because he is an old friend of mine," perhaps the owner has not much preference and he consents. How would you feel toward a certain manufacturer who would say to a customer of yours who had called to see some goods: "Oh, yes! Barnes is your plumber—he is a fine fellow and a good workman, but did you get an estimate from Thompson? He lives up your way, too. He is an old schoolmate of miue. I had him do a little work for me last fall; his price was reasonable and his work very good, and they say he is doing a fine business." There is not much said, but considerable implied. Your customer may step in to see Thompson, whose prices are about the same, so he gives him the job. I do not wonder that manufacturers are sometimes out of patience on account of the uncalled-for treatment they receive. As master plumbers, we should do unto others as we would wish others to do unto us. Therefore, when a manufacturer who is protecting our interests and has influenced an owner or architect to use or specify his goods, it is as much your duty to put them in and keep still about your favorite mauufacturer as it is for the manufacturer to show your customer his specialties and not speak of some other plumber.

MUTUAL PROTECTION.

As we are working for mutual protection we should be actuated by a spirit of fairness and generosity toward our neighbors. We should refuse, without the cousent of the first plumber, to finish any work commenced by another plumber when he has been compelled to stop work from causes not his own fault, such as non-payment of installments as the work progresses or unreasonable demauds on the part of the architects. An adherence to this rule will enable us better to assert our rights and secure prompt payment of money due us. When an owner, builder or architect presents a bill for work performed by another plumber, we should never question his prices, for you do not know the circumstances under which the plumber had to work. As a guide to members, a schedule of prices—fair, but not exorbitant—should be adopted. It will eradicate a discrepancy in prices and tend to restore the confidence of the public; for when one man goes to his plumber and then to another and finds the prices are about the same, he concludes that ueither is outrageously large, as one sometimes appears to be under present existing conditions. We have found this method most satisfactory, not only to our members but to the public as well.

Master plumbers should not only be working plumbers, but merchant plumbers, and should stoutly refuse to use any material they do not furnish, and *vice versa*. A strict adherence to this system will tend to a better enforcement of the Baltimore resolutions and will create a better feeling between manufacturers and master plumbers.

It has been demonstrated by strikes and lockouts that one class of individuals cannot override or control another, and that better relations can be maintained and more peaceful settlement of disputes consummated by a conference between the parties interested than by refusing to amicably discuss and adjust grievances in question. We have found that a conference committee with our journeymen has been very beneficial. Hours of work and wages are arranged for a year in advance and other matters of importance to both parties have been adjusted. We have not reached perfection along this line, but our success warrants us in recommending conference committees between masters and journeymen.

In many localities it is optional as to how plumbing work shall be executed, and it is needless to say that in such places unsanitary work and disease prevail. Not alone is this injurious to the health of the community, but it renders it difficult for master plumbers who know how and have a desire to do good work to compete with the impractical plumber, who has but little regard for sanitation and whose chief aim is to make the most money out of the job.

We believe, with New York and Massachusetts, that complete protection against this condition of affairs can only be obtained through legislation, and iu that direction we are exerting our influence and trust that our efforts will be crowned with success.

Organization of Master Plumbers' Associations and the Proper Limit of Their Actions.*

BY S. E. DIBBLE.

Experience has shown that organization, as distinguished from individualism, is generally necessary to promote great interests. So long as organized bodies strive to only promote their interest in a legitimate way, do not trample on the rights of their individual members, or antagonize the welfare of the public, they will, as a rule, meet with the most hearty co-operation of all with whom they are concerned, provided their aims be proper ones; and such an aim, I believe to be the advancing of sanitary laws, the study of sanitary subjects and the promotion of sanitary interests generally. Therefore I say that master plumbers' associations, coming within the scope of this premise, are desirable and ought to be successful.

QUESTION OF ORGANIZATION.

There is no subject that is brought so near home to all of us master plumbers as this question of organization. Many essays have

*Essay presented at the Detroit Convention of the National Association of Master Plumbers, June 19-21, 1894.

been written on various topics, but none of more importance than this one. Organization is the material on which we have builded, and out of the strength which this union has developed has come a success greater than it was possible for the most sanguine and far sighted of us to expect.

The National Association, the State and the numerous local associations have not only of themselves been beneficial, but to the individual members has come the added benefit which has made them stronger, nobler aud broader.

Of course pages might be written about associations existing only in name, of associations established but killed by intemperate enthusiasm, and of associations ruptured by discord, but the fact would still remain that the growth, strength and success of those that survive have come from organization.

The fouuders of these associations did not expect that formation was all that was necessary, but that formation having taken place, united action on the part of members should follow, and that aims having one common end should be pursued. With this in view, all practical master plumbers ought to associate together wherever feasible. Confidence in each other should above all be the aim and ambition of every member; next to promote and maiutain and advance the principles of sanitary scieuce through deliberations and harmonious action. Nothing should mar the proceedings of any meetings and all thiugs should tend toward the elevation of the individual members. Each should impart to the others the knowledge he obtains in the prosecution of his trade, banish all selfish purposes and seek to promote the good of his fellow members in the organization, as well as his fellow men out of it.

DISSEMINATION OF KNOWLEDGE.

Men of advanced ideas are always found in every organized body. They lose nothing by imparting at the proper time and in the proper place the knowledge they have acquired or the ideas which they possess, be they theoretical or practical. Those men will still remain leaders, and they have nothing to fear from dividing their knowledge and ideas with others. Men will always be found who cannot put in practice what they know full well in theory, and to the practical man should be imparted that knowledge lest all be lost. With the desire on the part of the individual members to impart their knowledge comes the production and perfecting of many important devices whose application in a practical way is of manifold uses

Such action has ofteu been and will be many times again the means of placing before the world many sauitary appliances adapted to the better protection of homes and families. Such results are bound to come from the united action of many and clearly show wherein our associations may be beneficial. All this, I am aware, calls for the sacrifice of self for the benefit of others. A very pretty sentiment, some of you may thiuk, and yet it is much more than that, for by it comes much of the progress and advancement in the world.

Nor should a man confine himself to the limits of his organization. He should look at it from without if he would know how to make the most of it. He should see how others outside of it regard it; how it is received by them and what are its effects upon them. He should be able to detect its defects and remedy them, and these may be far more easily detected by looking at them from without than by viewing them always from within.

SUCCESSFUL ORGANIZATION.

Successful organization requires in the organizers a somewhat unusual combiuation of qualities, among which may be mentioned a knowledge of men and their ways, the faculty of looking ahead and seeing into things, and the faculty of clearly understanding and clearly presenting exactly the objects desired. While experience is useful, I do not think it is essential, and it is astonishing how soon a shrewd and careful man will make a success of his undertaking, even though his experience be limited. Perseverance against many disheartening conditions is a sure requisite.

It is a well-known fact that a piece of timber is no stronger than it is at its weakest point: that is, the point by which its ability to do its work must be measured. This general law holds good in all works and may be applied to all combinations of persons, and is certainly true of associations like ours. There must be union, there must be interest, there must be persistent effort on the part of each and every member to make the whole successful.

As to the proper limit of the actions of such associations, I should say, in a general way, that anything that tends to promote the welfare and the interest of the members without injury to any is proper and right. Among the first objects to be attained comes the education of the young men who have selected our particular trade for their life work, aud upou whose efforts so much of the life and health of our people will in the future depend. This is an advancing age, and progress in sanitary science as well as iu other branches of science is sure to be made. Our organizations should be educators. This may be brought about by debate, by discussion, by papers carefully prepared. I care not whether it be done by the larger or smaller associations, by the city or the country, all if properly done is sure to have an elevating and beneficial effect upon our young meu.

In cities and towns where boards of health exist, the members of our associations should join with them in wise and useful legislation. Co-operation on the passage of laws and care in the exercise of those laws after they have been enacted should he the duty of us all. Such action would certainly result in promotiug the healthfulness and cleanliness of our respective municipalities.

Within the proper limits of our action comes also co-operation with the manufacturers and dealers with whom we are in contact. Orgauization giving to all its members equal facilities cannot but be profitable to us and to all those requiring the benefit of our labors.

Practically no association is limited in its action so long as it directs its doiugs toward that which is honorable, and for the good of all its work is never ended.

TRAPS AND VENTS.

H. C. BURNETT and R. M. BALDWIN have formed a partnership in a plumbing and gss and steam heating business at Bluefield, W. Va.

FRANK C. HOCK will open a plumbing and electrical wiring establishment in the Drake Block, Goshen, N. Y.

DENNIS SWEENY and W. B. BLOTTMAN will open a plumbing establishment at Greenville, Ohio.

MILLER & BISHOP, Scottdale, Pa., have added a plumbing department to their business.

OLDS & WHIPPLE of Hartford, Conn., have added sanitary plumbing to their already large steam and hot water heating busines. They have secured the services of B. O. Tilden of Boston to look after this department.

SECRETARY CASE of the Water Board, Detroit, Mich., sent out notices last week to the 90 plumbers who had obtained licenses from him, saying that they should be examined by the Plumbing Board of the Board of Health before July 1, and get certificates from the latter. Quite a number have been examined by the Plumbing Board and half a dozen were unable to pass the necessary examination. These will be unable to work as master plumbers after July 1. At that date and thereafter every master plumber must show a certificate from the Board of Health.

The British Board of Trade returns for the month of May do not, says the *Economist*, give much encouragement to the theory that the trade of Great Britain is reviving, since there is a falling off on both sides of the account as compared with the corresponding month of last year. In imports the shrinkage amounted to $12,980,000, the falling off being most marked in textile materials. Exports were $1,622,400 less than in May last year.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

THE CONTRACT for putting in the heating and ventilating apparatus at the Vermillion, S. D., University has been let to the B. F. Sturtevant Company of Chicago at $4400.

W. E. PAUL, Portsmouth, N. H., secured the contract for supplying the steam heating apparatus for the Saco Hotel, Saco, Maine.

THE CONTRACT for ventilating the Knapp School, Somerville, Mass., was awarded Braman, Dow & Co. of Boston, amount of bid being $1600.

THE CONTRACT for plumbing work on the city building and in the Fifth Ward engine house, New Castle, Pa., was let to W. B. Bagnall.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until July 6 for the steam heating and ventilating apparatus for the United States Post Office at Houghton, Maine. Drawings and specifications may be obtained from the Supervising Architect at Washington or from the superintendent at Houghton, Maine.

THE ARNOLD COMPANY have taken the contract for the hot water heating in W. R. Demarest's new house on Sherman avenue, New Haven, Conn. The same company have the steam heating of John Reichel's new house in Fair Haven, Conn.

ARCHITECT WM. H. ALLEN has given the contract for the plumbing work in the new Seamen's Bethel, on Water street, New Haven, Conn., to the New Haven Heating & Plumbing Company. T. W. Corbett of New Haven has been awarded the heating contract.

WALKER & CAREY, East Main street, Waterbury, Conn., have taken the contract for the plumbing and tinning of the Connecticut World's Fair Building at West Haven, Conn.

SEALED PROPOSALS will be received by the president of the Board of Trustees, Milledgeville, Ga., until July 10 for work including the steam heating, plumbing, &c., in a new asylum building.

AT A RECENT MEETING of the Board of Supervisors it was decided to heat the court house at Champaign, Ill., jail and sheriff's residence by steam.

R. H. WALKER, Elmira, N. Y., was awarded the contract for heating the County Court House at Watkins for $2857.

SEALED PROPOSALS will be received at the office of the Supervising Architect, Washington, D. C., until June 27 for labor and materials and fixing in place complete eight new hot water boilers in the United States Custom House and Post Office Building at St. Louis, Mo. Drawings and specifications may be obtained from the Supervising Architect, Washington, or from the superintendent at St. Louis.

CASWELL & MOORE, Phœnixville, Pa., have received the contract for the tinning and plumbing of a new block of houses to be erected by Mrs. Gillardon on Washington avenue in that town.

KEHM BROS. & MERTZ, 289 East Kinzie street, Chicago, are to install a hot water heating plant in the residence of

A. Von Tesmar, 233 Orchard street, and a steam heating plant in the McPherson School, Wolcott street, near Lawrence avenue, Ravenswood.

FLASHINGS.

DISLEY & WEYAND, Waterbury, Conn., have a contract for the metal work on the new Methodist church in Derby, Conn.

THE AMERICAN ROOFING COMPANY, Cincinnati and St. Louis, report the shipment of something over 16 carloads iron and steel roofing to various points in the State of Texas during the month of May, while orders from various sections continue to come in very satisfactorily.

THE CAMBRIDGE ROOFING COMPANY of Cambridge, Ohio, have recently purchased and now have in operation a modern outfit for the manufacture of galvanized eave trough and conductor pipe. Both are made in sections 10 feet long, without cross seam, and the large orders which have already been booked would indicate that their product in this line is fully up to standard, as is also their line of metal roofing and siding.

THE METAL STAMPING & SPINNING COMPANY of Grand Rapids, Mich., have issued a fine catalogue of their specialties for the season of 1894-95. It comprises 80 broad pages of illustrations of architectural ornaments and statuary, which are made by the company in sheet zinc, copper, brass and aluminum. These comprise capitals in numerous rich and original designs, rosettes, leaves, garlands and wreaths, points and drops, heads and faces, shells, angles and mansard leaves, panel ornaments and scrolls, enrichments for moldings and friezes, panel scrolls, gable ornaments, steel ceilings, crestings, finials, chimney tops, metal shingles, stamped sign figures and letters, rock face siding, bracket and modillion rolls, balls, &c. The company also manufacture copper, brass and tin ware. A feature of this catalogue is that prices are given in each case in immediate connection with the article. Another feature, still more noteworthy, is that the designs shown are largely original.

THE GLOBE IRON ROOFING & CORRUGATING COMPANY, Cincinnati, with rolling mills at Newport, Ky., state that they did more business in roofing material during the month of May just past by at least 25 per cent. than the same period in 1893, the latter having been the banner month in the history of their business career. While orders are still continuing very satisfactorily, during a brief interval they were compelled to run both rolling mills and corrugating establishment night and day. They also congratulate themselves on the fact that since January 1 this year their mills have never been shut down or idle in any single department for any reason whatever, no breakages or repairs of any kind having been found necessary.

"WHAT THE PEOPLE SAY" is the title of a pretty pamphlet brought out by the Metallic Roofing Company of Canada, Limited, Toronto and Montreal, Canada. It is a book of general testimonials relating to their shingles, which include the Eastlake, Empire and Thorn's patent steel shingles. The first mentioned is illustrated as a frontispiece to the pamphlet. Attention is likewise directed to Hayes' patent steel lathing. The other shingles are shown at the back of the volume, together with tiles, rock faced steel siding, &c. The testimonials come from all parts of the Dominion and fill about 50 pages.

J. FOERSTER & SON of 806 East Fifth street, New York, have recently completed the copper work and slate roofing on the church at the corner of Oliver and Devoe streets, and the copper cornice, finials, ventilators, towers, skylights and slate roofing, including the galvanized iron ventilating pipe work, on the school house in Herkimer street near Ralph avenue, Brooklyn. The special feature of this job is that no iron whatever is used in connection with the copper work, the copper roofing being fastened with copper nails, while the gutter braces are of brass and the hinged leader fastener of copper nailed to the walls with ½ x 3 copper nails. The lightning rod is also of copper fastened to the walls with brass staples made expressly for the purpose. The rivets are of copper and the bolts brass. Foerster & Son have also completed many other smaller contracts.

SHACKLETON BROTHERS have recently taken possession of new quarters at 171-175 Prospect street, Cleveland, Ohio, where with increased equipments, additional floor room and good light they are prepared to supply first-class work at low prices. They make a specialty of slate roofing, Hayes' skylights, steel ceiling (Kinnear's patent) and sheet metal work for buildings and other purposes. The slate yard of the firm is located on Cedar avenue in the city named.

THE AMERICAN ROOFING COMPANY, St. Louis and Cincinnati, report an excellent demand for corrugated iron. Some months since they added a new branch to their business, that of making gutters, eaves trough, conductor pipes, hangers, &c. This depatment has steadily grown and now requires a great deal of their attention. Their gutter catalogue, containing everything they make in this line, is being sent to the trade on application.

Recent Treasury Decisions.

Drawback on Tin Handles, Nozzle Bodies, and Caps Attached to Tin Cans.

On high tin handles made from imported IC tin plate, and on low screw tin nozzle bodies, and flat tin caps made from imported taggers tin, attached to 5-gallon tin cans manufactured and exported by the Standard Oil Company of New York, Sone & Fleming Works, a drawback will be allowed equal in amount to the duties paid on the quantities of imported materials used in the manufacture of such articles, less the legal deduction of 1 per cent.

The quantities so used may be determined by allowing 40 pounds of IC tin plate for each 1000 high tin handles, 10 pounds of taggers tin plate for each 1000 low screw tin nozzles, and 7 pounds of taggers tin plate for each 1000 flat tin caps.

Drawback on Steel Clock Spring Material.

On the exportation of steel clock spring material, rolled, tempered, polished and prepared for cutting into lengths suitable for clock springs, manufactured by R. H. Wolff & Co., Limited, of New York City, from imported steel wire rods, a drawback will be allowed equal in amount to the duty paid on the rods used in the manufacture, less the legal deduction of 1 per cent.

The quantity of imported rods so used shall be determined by adding to the net weight of the exported article, as certified by a United States weigher, 16 per cent. of such weight.

The drawback entry must specify the size of the clock spring steel material and the gross and net weight of each package to be exported, and the manufacturers' declaration on the entry must show that the article was manufactured in accordance with their sworn statement dated August 9, 1893.

Drawback on 1 and 2 Gallon "Round" Tin Oil Cans.

On the exportation of 1-gallon and 2-gallon "round" tin cans manufactured by the Standard Oil Company of New York at the Devoe Works a drawback will be allowed equal in amount to the duty paid on the quantities of imported pig tin and pig lead used in soldering such cans, less the legal deduction of 1 per cent.

The quantities of such tin and lead which may be taken as the basis for allowance of drawback shall be for 1-gallon cans 64 per cent., and for 2-gallon cans 73 per cent. of the allowance provided in the instructions of January 26, 1894 (Synopsis 14,592), for 5-gallon rectangular cans, subject to the special provisions and limitations of said instructions.

Hunting Knives—Certain Pocket Lock Knives Not.

Before the U. S. General Appraisers at New York, March 5, 1894. In the matter of the protests, 58,281 *a*-13,927, &c., of A. Kastor & Bro., *et al.*, against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on certain pocket knives or lock knives imported per the vessels and at the dates named in the annexed schedule Opinion by Wilkinson, General Appraiser.

The goods are knives with horn or bone handles. Each has one large and one small blade; some of them have corkscrews, picks, &c., in the back, and all of them have lock springs to keep the large blade fixed when open, the knife being shut by pressure upon the small blade. The merchandise was assessed for duty under the provisions of paragraph 165, N. T., for pocket knives, and is claimed to be dutiable under the provisions of paragraph 167 for hunting knives. Paragraph 165 provides for "pocket knives of all kinds."

We find that the knives in question are designed to be carried in the pocket; that they are so commonly carried, and that they are in fact pocket knives.

The protests are overruled accordingly.

A peculiar feature of the transatlantic passenger traffic at the present time is that the larger tide of steerage travel is flowing eastward rather than westward, as is generally the case at this season. Outgoing steamers from New York are sailing with crowded steerages, while immigration is not up to the average. This is attributed to the existing business depression and comparative scarcity of employment in this country.

W. A. Stanton, secretary and treasurer of the Fayette Manufacturing Company, manufacturers of silica brick and magnesia, sailed on the "Campania" last week. He goes to the Continent to transact some business there.

At a fire in Dubuque, Iowa, last week, 22,000,000 feet of lumber were burnt up.

STEAM AND HOT WATER.

Convention of Master Fitters.

The Master Steam and Hot Water Fitters' Association of the United States began its sixth annual convention in a hall of the Broadway Central Hotel, New York, June 19.

TUESDAY MORNING.

The first session of the convention began at 11.20 o'clock President Rutzler in the chair. The roll call and reading of minutes having been dispensed with, by motion the president then appointed the following Credential Committee:

A. E. Kenrick, Boston.
E. D. Smith, New York.
C. H. Simmons, Chicago.
W. P. Thompson, Philadelphia.

After the appointment of the committee a recess was taken till 2 p.m.

TUESDAY AFTERNOON.

At 2.30 the delegates assembled, and the first order of business was the presentation of the president's address by Mr. Rutzler, extracts from which are given below:

President's Address.

I congratulate you on this, our sixth annual convention, that, after the financial and general commercial strain and universal lack of business covering the whole of the United States for the past year, there are enough of us left to make so fine a showing at this meeting. The position of the officers of the association for 1893-94 can perhaps be justly compared to that of men in the divers lines of business in our country, which is summed up in a few words of but little to do and an insufficiency of funds to do that little with.

Perhaps it is fortunate for me that my term of presidency should have fallen at a time when there has been so few demands upon us. To have accomplished so little in an ordinary year would be embarrassing indeed, but under the depressed circumstances through which our country has passed I am confident that you, as fair minded men, could not have expected very much. . . .

You are all familiar with the action taken at our last annual meeting in the matter of standard flanges, adopted as reported by our committee. Manufacturers have since suggested a few changes. This question was brought to the attention of the Executive Committee and myself, further mention of which will be made in the secretary's report.

Our Committee on Standard Flanges is still in existence. In my opinion this question should be referred to them again, that they may specially consider the changes recommended, perhaps in conjunction with a committee of manufacturers, or at least such manufacturers as are present or have representatives here. I am convinced that standard flanges is a long stride in the right direction in our interest and that of our patrons, and of the manufacturers as well. The ground of all these desirable features was so thoroughly covered in the discussion at our last convention that it is not necessary for me to bring them to your attention at this time any further than to say that letters received in answer to the pamphlets issued embodying the action showed a hearty approval on the part of the manufacturers.

It would be well, however, that we consider at this meeting what the percentage of inquiry by steam fitters has been for standard flanges, and how far they are endeavoring to use them in their work. You will remember that so far as was practicable we were to use in our business nothing but standard flanges after January 1 of the present year. One manufacturer, to my knowledge, has already made the necessary changes and is ready to supply the standards adopted. How extensively this has been done, or how many firms are thus equipped, is more than I have been advised of.

I am led to say that I never so fully realized the respect in which this association is held by the supply trade as I have since holding the position of president. I had always underrated our worth as an organization before, and I believe every member to-day who has not held office in it is undervaluing our strength. I think there are few, if any, manufacturers who are unwilling to extend to us what is our due. It is my opinion, too, that on account of the want of a full realization of how others look upon us, and with the uncertain value we place upon the organization ourselves, results are minimized and our effectiveness seriously impaired.

We have spent four years now, and I might say five, in trying to induce men who do a small amount of heating in connection with some other business to identify themselves with us and have our assistance in removing obstacles that are in their way. The question arises with me now, is it not better that we band together, as we should in the larger cities, and say we are going to take care of this association, leaving it with these outside parties to come with us if they want to, meeting them nine-tenths of the way when they offer to come, and do them all the good we can, but not hunt for them any more? Our lowest rate is $10 per year; it is barely possible that it might be made $5, but I do not believe if it were these men would do more than talk. They would rather keep that $5 than come into the association, and by some healthy method in the localities where they are doing business benefit themselves to the amount of $500. The National office has been filled with letters for the past two or three years wherein men state they cannot put a price upon their work because the consumer can get goods first hand.

I say this is purely the fault of men in localities where such transactions take place. I do not think they could do very much by themselves, but if they will join together and become members of this organization we can benefit them and stop such conditions. I know of one small city where all the letters we have had this year have been encouraging—not one complaint. They pay their dues promptly, and are acting in a fair and honest way toward each other. They originally simply sent out letters to the supply trade stating that they belonged to the national association, and I am confident they have had nothing to complain of in the way of violations. Their secretary writes that although they have not done one-third the work they did the year before, their profits have been greater.

There is another subject that I wish to call your attention to, and that is: the contracting for work and guaranteeing a temperature of 70° Fahrenheit in zero weather. I think a committee should be appointed to recommend a remedy for this complication. .

I call this matter to your attention believing that steps should be taken at once that will prevent any further encroachment upon our rights in this direction. We must not forget that we are nearly always the last contractors to complete our work, and if the party from whom we have taken our contract should run short of funds after he has paid all others, we have to wait until he gets good and ready to settle, with the possibility of losing the final payment or a portion of it entirely. We should not allow our anxiety to close a contract to lead us into accepting conditions that in many instances result in a loss on the work performed. Such contingencies can only be avoided through regulations and agreements among ourselves, through our local and national associations. The grievance cited here is one that I think our whole country is afflicted with, and therefore the special necessity of national action upon it.

For the honor which you conferred upon me at our last convention by electing me to the office of president I wish to earnestly thank you, and to attest that the duties have been pleasant as well as beneficial to me as a member.

At the close of the address, which was received with applause, Mr. Hudson moved that it be referred to the Executive Committee and the recommendations contained in it be reported upon Wednesday morning.

Before the presentation of the secretary's report, President Rutzler introduced David M. Nesbit of the London firm of Ashwell & Nesbit, heating and ventilating engineers, who later was to read a paper before the association. Mr. Nesbit spoke of the gratification it gave him to receive so warm a welcome. He referred to the excellent work he had seen in heating plants in New York and intimated that heating engineering was further advanced in this country than in England. Mr. Nesbit closed with a cordial invitation to any or all of the members to visit him should they ever go to England. Following this pleasant little episode Secretary Reynolds read

his report, of which we print part below:

Secretary's Report.

For the sixth time in the history of this association I place before you a review of a year's work, with a comment or two added.

As usual, the first few weeks were consumed in moving, installing ourselves in new headquarters and sending forth matter mapped out by the annual meeting. A mimeograph copy of the resolution of the Committee on Manufacturers and Jobbers was distributed very soon after our arrival in New York, as directed by the convention. This resolution you will remember reads as follows: "Your committee respectfully recommend that manufacturers and jobbers be requested not to sell goods to the consumer except to those who are already exempted by our former national consumers' discount sheet."

Pamphlets containing recommendation of the Committee on Standardization of Flanges and the action of the convention in the matter were printed at the earliest possible moment and placed in the hands of all steam fitters and manufacturers throughout the United States.

The letters called forth by this pamphlet were numerous, and were unanimous in the sentiment that the step was an important and well considered one from all points of view.

Some of the manufacturers were of the opinion that several of the diameters recommended could be improved upon, and at the request of a few of them a call was issued for an executive committee meeting, and President Rutzler invited Carlton W. Nason, chairman of the Committee of Mechanical Engineers on standardization, to be present. A protracted session resulted, and it was the conclusion that the committee had better abide by the decision of the annual meeting, especially as the scale of standards had been placed in the hands of those concerned, leaving it with the manufacturers to come together and change such sizes as they deemed best. The matter was not again referred to until December, when we received a call from E. P. Bates, chairman of your Committee on Standardization. He stated that he had been requested to recommend the following alterations: "That the 3½ and 4 inch flanges be changed from four bolts to eight, the bolt holes being made ½ inch in diameter instead of ⅝."

The advisability of the committee's acting upon this was considered at length, and it was decided that they were not at liberty to do so, and thus the subject rests. . . .

LOCALS.

Reports from the various locals all through the year have not been very encouraging, but this is not surprising, taking into consideration the state of business generally and the limited amount of building undertaken in many localities.

TRAVELS.

As to my travels this year and my efforts to form new locals, I have very little comment to make. I have undertaken several short trips, but they have not been productive of much good, at least the results are not yet visible. There has been but little to warrant venturing the expense of traveling and seeking to increase our strength since our last annual meeting.

I was advised by one of our members that firms in New Haven, Conn., were anxious to come into the fold and do something for themselves. Upon this information I made a visit there, but could not succeed in getting them together at that time. I planned with one of the firms to arrange a meeting at a later day and advise me. This he undertook to do, but the report from him was that he did not meet with any success.

Two trips to Paterson, N. J., showed about the same results.

William P. Thompson of Philadelphia has been earnestly working the whole year to revive the local in that city and recently has been holding meetings with some promise of success. Mr. Thompson will be here to report what encouragement he has met with.

I have made four trips to Philadelphia since the headquarters have been in New York City, and I can assure you they are in something the same condition there that the city of Boston was in at the time of my first visit. All I can say is, if they were thoroughly organized with a view to making the situation as bad as possible it could not be any worse than it is.

On April 5 I started on a journey west. I first went to Cincinnati, where I think I accomplished some good; at least, we have recently received very favorable reports from there, which we hope will be verified at this meeting. From there I went to Chicago, where I found contracting employers of labor in all lines in a siege with their men, and there was no prospect of diverting the minds of our people from that issue. It is indeed a sorry day for organizations when Chicago men, with their experience, need any urging in association affairs.

Prior to leaving New York I had written St. Paul and Milwaukee inquiring if I could do any good by going there, and requesting them to reply to me at Chicago. Their answers were that they would be glad to see me, but they did not think I could be of any benefit. The one from St. Paul indicated that nothing could be done for them at the present time.

This is attributable largely to the financial condition of the country, there being really no prospect of work except perhaps to a limited extent. The letters from Milwaukee set forth that their local was in good condition, with an increased membership, but had not a very flattering prospect of business, and they urged for lower dues, &c., which they have since reduced.

From Chicago I went to St. Louis, where the men for a long term of years have failed to accomplish very much toward sustaining each other or their business as a whole. I could not remain there longer than two days, and I think from reports since my return that I did them some permanent good.

From St. Louis I visited Cleveland, where I found a grievance that was slightly unique. I will explain this in private conversation only. I did what I could during my short stay there to convince those I saw that the division existing between them was destructive in the extreme. We have late information that they have reorganized on somewhat new lines and that they will be represented at this meeting. Certainly this is encouraging, and we hope they will be here to speak for themselves. . . .

DISCOUNT SHEET.

Referring to the resolution passed at our last convention recommending that manufacturers and jobbers be requested not to sell goods to the consumer except to those who were already exempted by our former national discount sheet, it is proper to report that so far as my observation has gone this resolution has not had the slightest consideration from either the sellers of goods or our members. The measure of disrespect it has received from all directions is sufficient to teach that no possible good can accrue to your association from this policy or any other wherein the manufacturer or jobber is expected not to sell to the consumer. The only thing that has been of any avail in that line was the original discount sheet, which it is undoubtedly safe now to again reinstate, but on slightly different lines.

The storm created by the circular relative to it (that was issued in 1892) has now blown over, and experience has taught that it would have been wiser to couch it in milder language; and had this been done, beyond a doubt there would have been no sharp criticism upon it. The fault of the wording of the circular you can attribute to me. I am not willing, however, that you should charge I am not ready to learn from experience.

Personally I am of the opinion, based upon close observation, that much more can be accomplished through appealing to the sellers of goods than by demanding. No firm in the United States can successfully cover up a method of selling to the consumer at trade prices. It will get into the atmosphere in spite of them, and they cannot escape the odium that will positively follow, provided you maintain your organization and keep any recorded data of this character.

HOT WATER BOILERS.

We have had some letters relative to the hot water boiler plague during the year, and in addition to this I have held conversations from time to time with a few in that line with reference to the disagreeable features in connection with the present practice. I have endeavored to induce one very competent gentleman who has had a large experience in handling boilers with the trade to write an article upon the subject. I hoped at one time he would do so, but later on he informed me he was too busy. I am inclined to think it is a question he felt more like giving up than attempting to recommend a remedy for, feeling possibly that he could not do the situation full justice. I do not believe anybody could. While a few have punished themselves sufficiently by losing money on taking contracts a large number seem still to continue in the business.

I saw a reference a short time ago to the importance of a man being protected against himself. I think there is a good field among the hot water boiler people for some enthusiast to do a great mission work in this direction that could be classed as a blessing pure and simple.

AMALGAMATION.

The question of amalgamation of the two associations of master steam fitters and master plumbers, which has been discussed pro and con, and of which President Hudson spoke very decisively in his report last year, has been decided for the present at least. . . .

CONCLUSION.

It is painful, indeed, to be called upon to announce to you so long a list of losses by death of valuable and worthy members in our organization since our last meeting: Herman A. Kroeschell of Chicago, Hazen Mooers of Milwaukee, I. Lincoln, Jr., of Chicago, George Strong, president of the

Joliet local, and William Costello of South Boston, Mass.

In conclusion, in grateful appreciation of the support of our president and Executive Committee and of many faithful and energetic members in the work for you, I wish to express my most earnest thanks, and to add that the future success and dignity of your commercial affairs depends largely upon lines mapped out at this meeting. I say this, believing that no convention you have yet held can be classed with it in importance. Recognizing how easy and natural it is to err causes me to look upon the results of your present gathering with much concern. In proportion as you study and prepare in the interest of the whole will you best serve yourself individually. No single person's interest to the detriment of the mass of you should receive one moment's consideration. This last remark particularly includes your present secretary.

Hoping that the best possible action in your behalf will prevail, I again thank you, one and all.

At the close of the secretary's report P. S. Hudson was called upon to read a communication from the ruler of these parts presenting the keys of the city. It was a humorous production involving the most extraordinary sequence of misapplied epithets and double meaning words.

The treasurer, E. D. Smith, then reported receipts of $8843.90, and disbursements of $8626.36, leaving a balance of $217.54.

J. L. Wells next read the report of the Executive Committee, from which we quote as follows:

Executive Committee's Report.

The reports of our president and secretary having covered all congratulatory features leave us no duties to perform in that direction any further than to say we welcome and are indeed glad to meet you, and we are with you, of you, and for you.

The chief work at this convention is to endeavor to anticipate what the conditions before us are likely to be, and to plan wisely enough to meet them in the most substantial and far reaching manner, remembering always that we are ever nearest success when we are adhering to the lines of consistency and justice.

This sentiment should be carried particularly into our local relations with each other, as well as our national. New lines, new men, new ideas and developments of every description are constantly being introduced. Those who are attempting to do their business to-day, locally or nationally, upon the conditions that existed two, five, or ten years ago, will learn later to their sorrow that they have not fully kept abreast of the unceasing march of progress they are ever forced to come in contact with.

While it might have been comparatively safe ten years ago to presume upon a continuance of given patronage, it will not do to build upon any such expectations to day, when younger men are inheriting seats at the commanding desk, bringing to it new conditions, new associates and new friends made in other channels and at other clubs. No single firm can stand now and successfully say, "We are the people." Where it was once mostly multiplication and addition it is now nearly all division and subtraction. We must not forget that the school house of the present is preparing well equipped contract seekers more rapidly and in greater numbers than in the past. Added to this, they have the advantage, through the numerous trade schools in different sections, of becoming practical and trained experts in a time brief compared to the old methods of developing men. Hence the necessity of those in the business now following lines that are least likely to leave their profits with those for whom the work is done. There is nothing rational in conducting our business at cost prices this year with a view to advertising, trusting that by such means we shall insure an increase of patronage later on to which we may add fair profits. . . .

In answering the questions many times asked in regard to the value of our organization, and what it has accomplished, it is to be regretted that the sum total of what the association has prevented in the way of dissster coming upon our trade cannot be pointed out, and it becomes doubly lamentable when we remember that it is a condition none realize or appreciate, even in a fractional part. . . .

It is perhaps due you that we refer to our lack of membership in cities with less than 75,000 inhabitants. There is no doubt but that the firm stand taken by steam fitters in our large cities reflects a benefit to the lesser ones referred to, and there is no question either but that the disorganized condition in the smaller cities reflects detrimentally to the larger ones. It is certain that if steam fitters in these cities would take steps to benefit themselves through organization and become members of the national, the result universally would be of great benefit.

The query arises, why do they decline to do this? We have a few men in cities of less than 50,000 inhabitants who have benefited themselves wonderfully, and they are a substantial aid to our organization. If there could be a general, spontaneous uprising of such a character in all these cities the good returns would be beyond any man's power to foretell. They can have a membership with us at the rate of $10 per year, and the amount it would cost them to maintain their local would be mercly nominal. Can it be possible they think it is profitable to them to save these small amounts? Surely they could not prove that it is by those who have tried it in an earnest and substantial manner.

This has been a problem of much concern to every former executive committee, as well as the present one. There has been much thought and work devoted to inducing such parties to join with us and thus rectify many irrational things that exist among us. It has been impossible thus far to move them, and it is beyond our power at the present time to point out a remedy, but we do hope that at this convention some one will be able to make suggestions which will prove profitable in this direction, or else, as our president suggests, we should look after our own affairs and cesse further urging in this direction. The national association up to date has been almost wholly supported by the larger cities, and possibly we shall be forced in the future to rely entirely upon these sections for maintenance without endeavoring to do any particular good outside their limits, for surely it is discouraging to be forever pleading in vain.

Relative to the house heating boiler question, as slightly touched upon by the secretary in his report, we think this feature should be again gone over at this meeting. Possibly some one may have a recommendation to make. We suggest that a committee be appointed to consider the matter. Some of the boilermen who have had a wide experience in installing work claim to have abandoned that practice. We suppose it is fair to assume that others will, through the same experience, later on do likewise, but we must admit that it is slightly aggravating to have to wait for these people to gather in this very costly knowledge.

It would not be so provoking if the losses and injury all fell upon themselves, but that is not the case. It reflects on a l of us, and their patrons as well. It forces us in many instances if we take contracts to leave our profits with our customers, while on the other hand we are injured by the imperfect work put in from time to time after it is learned that the contracts have been taken at figures that are sure to cause a loss of money; for surely when they do that they are by a necessity forced to furnish as little as possible and put that little in in as cheap a manner as they can conceive of and have the whole pass inspection and get their pay. This injures steam and water heating the country over, for the reason that it causes many to hesitate about using either in small plants. . . .

Committees.

After the reading of this report the president appointed the following committees:

Standard Flanges.

E. P. Bates.
A. C. Walworth.
S. J. Geohegan.

Permanent Headquarters.

E. P. Bates.
A. B. Franklin.
Geo. A. Jackson.

Constitution and By-Laws.

A. B. Franklin.
Wm. P. Thompson.
E. P. Bates.
John Davis.
A. C. Walworth.

Appeals and Grievances.

C. H. Simmons.
A. E. Kenrick.
F. A. Williams.
Geo. H. Morris.

Good of Order.

Wm. P. Thompson.
Jno. W. Danforth.
Wm. E. Bartlett.
J. F. Buerkel.
A. B. Franklin.
P. H. Hudson.

Credential Committee.

A. E. Kenrick.
E. D. Smith.
C. H. Simmons.
Wm. P. Thompson.

Reinstatement of Discount Sheet.

James Curran.
C. H. Simmons.
John B. Hughes.
A. C. Walworth.
P. H. Kendricken.
E. D. Smith.
John Davis.

House Heating Boiler Question.

John W. Mills.
H. J. Barron.
Geo. H. Morris.
John W. Danforth.
Chas. B. Kruse.

Ways and Means, Including Publication of Souvenir.

Wm. P. Thompson.
E. P. Bates.
J. L. Wells.
Geo. A. Suter.
John B. Hughes.
Jno. F. Buerkel.
A. B. Franklin.
W. K. Downey.
John Danforth.
C. H. Simmons.
Alfred Gawthrop.

Guaranteeing Temperature.

E. P. Bates.
Jas. Curran.
John Danforth.
A. E. Kenrick.
Geo. A. Suter.
F. K. Van Court.
S. J. Geohegan.
W. K. Downey.

Resolutions of Sympathy, etc.

A. B. Franklin.
John Whittet.
William S. Phillips.

The session adjourned at 4.30 to meet Wednesday morning at 10 o'clock.

WEDNESDAY MORNING.

Owing to the time occupied in the preparation of the reports of the standing committees the convention did not assemble until 11.30 o'clock. Several committees were called upon for reports, but as they were not ready the first business taken up was a communication from the Massachusetts association on the subject of reorganizing the National Association. The communication was referred to the Committee on Constitution and By-laws. The Committee on Credentials then reported the following delegates present:

List of Delegates.

BUFFALO.

John W. Danforth.
Jos. L Whittet, Whittet, Barrett & Co.
Jos. L. Whittet, proxy for Brand & Ceiger.
Jos. L. Whittet, proxy for W. A. Case & Son.
Jos. L. Whittet, proxy for Clark & Co
Jos. L. Whittet, proxy for J. H. Ruckel & Co.

CHICAGO.

C. H. Simmons, Theo. Jacobs Company.
John Davis, John Davis Company.
P. S. Hudson, Baker & Smith Company.
P. S. Hudson, proxy for Chicago Heating Company.
P. S. Hudson, proxy for Kroeschell Bros.
P. S. Hudson, proxy for John Woodman.
P. S. Hudson, proxy for W. D. O'Brien.
P. S. Hudson, proxy for Geo. C. Mickow & Co.
P. S. Hudson, proxy for Illinois Heating Company.
P. S. Hudson, proxy for F. W. Lamb & Co.
P. S. Hudson, proxy for M. J. Cragin.
D. M. Quay, Wills & Newton Company.
John W. Mills, L. H. Prentice Company.

MILWAUKEE.

Charles B. Kruse, Chas. B. Kruse Heating Company.
Charles B. Kruse, proxy for Davies & Lohman.
Charles B. Kruse, proxy for Cordes & Tries.
W. K. Downey, H. Moores & Co.
W. K. Downey, proxy for M. Coogan & Co.
W. K. Downey, proxy for A. J. Lindeman & Hoverson Company.
W. K. Downey, proxy for Grassler & Gezelschap.

NEW YORK.

E. Rutzler.
E. D. Smith, Baker & Smith Company.
J. L. Wells, Wells & Newton.
S. J. Geoghegan, Gillis & Geoghegan.
F. W. Williams, Blake & Williams.
James Curran, Jas. Curran Mfg. Company.
Andrew Mercer, H. B. Smith Company.
William S. Phillips, Phillips, Doup & Co.
Geo. H. Morris, Johnson & Morris.
Fred. K. Van Court, Bonner & Van Court.
Jno. Neal's Sons.
Peter Backus, of Peter Backus & Son.

MASSACHUSETTS.

P. H. Kendricken, Ingalls & Kendricken.
P. H. Kendricken, proxy for Walker, Pratt & Co.
A. C. Walworth, Walworth Construction Company.
J. F. Buerkel, J. F. Buerkel & Co.
A. E. Kenrick, Kenrick Bros.
Wm. E. Bartlett.
Nutter & Seabury.
John C. Honeyman, Thayer Heater Company.
Daniel Russell.
Wm. Smallman, Isaac Coffin & Co.
John B. Farnsworth.
A. B. Franklin.
A. B. Franklin, proxy for G. M. Parks.
Lawrence E. Milleay.
E. W. Fiske, Smith & Anthony Company, Boston.
H. W. Heath.

PROVIDENCE.

Geo. A. Jenks, Union Steam & Gas Pipe Company.
Henry F. Root, H. F. Root & Sons.
F. Coggshall.
Don J. Husey, proxy for Capital Heater Company.
E. R. Bryant, Pawtucket Steam & Gas Pipe Company.
J. M. Smith, H. B. Smith Company.

PHILADELPHIA.

W. P. Thompson, Thompson Bros.
W. P Thompson, proxy for Reeves & West.
John C. F. Traeschel.

ST. LOUIS.

John B Hughes, Hughes & Stone.
John B. Hughes, proxy for Globe Steam Heating Company.
John B. Hughes, proxy for Doherty Bros.
John B. Hughes, proxy for Missouri Steam Heating Company.

Isolated Members.

Alfred Gawthrop, Alfred Gawthrop & Bro. Company, Wilmington, Del.
John C. Brison, Brison Plumbing & Heating Company, Wilmington, Del.
John Collis, Des Moines, Iowa.
Peter Forve & Bro., Wilkes-Barre, Pa.
H. A. R. Dietrick, South Bethlehem, Pa.
C. Y. Beach, Bridgeport Steam Heating Company, Bridgeport. Conn.
E. P. Bates, Syracuse, N. Y.

After the report of the Credential Committee was received the following resolution, presented by Jno. W. Mills, was adopted:

Whereas, We learn with pleasure that the annual convention of the National Association of Master Plumbers, now in session at Detroit, is a success both in attendance and enthusiasm: therefore

Resolved, That we wire our congratulations and hopes that both our associations will be successful in receiving that protection which we both need to insure our success.

In accordance with this resolution the following telegram was sent:

We send congratulations on your successful meeting and hope each association will secure complete trade protection.

At this point in the proceedings A. S. Purdy of Toronto, Canada, was introduced to the meeting and spoke on the subject of extending the organization to Canada. The matter was referred to the Committee of Ways and Means.

After it had been decided to devote the afternoon session to the reading of papers a communication was read from H. Brill, general manager of the New York Trade School, inviting the delegates to visit the school while in the city. On motion of A. B. Franklin it was decided to accept the invitation and visit the school early Thursday morning.

L. D. Sherman, who represented the manufacturers, was introduced and asked if the convention would be free for the entertainment provided for Thursday afternoon and evening. He also invited the delegates to an entertainment for Wednesday evening. Adjournment was then taken at 12.30 o'clock till the afternoon.

WEDNESDAY AFTERNOON.

The delegates assembled at 2.30 o'clock and the proceedings were begun by receiving the report of the Committee on Revision of Discounts, which was submitted by Mr. Curran without reading, the meeting deciding to postpone the discussion.

As provided for at the morning session, the next order of business was the reading of papers. The first presented was on "English Practice in Heating and Ventilation," by David M. Nesbit of London. Mr. Nesbit illustrated his paper with diagrams on the walls of the convention hall, which added to the interest of the essay.

The second paper, on "The Difference in Amount of Radiation Required in Buildings of Good and Poor Construction," by E. P. Bates, was listened to with much interest. The paper is printed in full elsewhere. The third paper of the afternoon was entitled "Types of Heating Boilers in the United States" and was read by A. C.

Walworth. At the close of this paper it was decided to defer the further reading of papers, and on motion of Mr. Kenrick the meeting went into executive session to consider the reports of the committees of Ways and Means and Revision of the Constitution. The meeting adjourned late in the afternoon to meet again Thursday morning.

THURSDAY MORNING.

The convention was called to order at 10.30 o'clock and the proceedings opened by a paper, "How to Benefit the Trade," read by D. M. Quay of Chicago.

The president read a congratulatory dispatch received from the secretary of the National Association of Master Plumbers, in convention at Detroit, in answer to a similar dispatch forwarded to them by this association.

Next in order was a letter received from Chas. Barnett, representative of the National Asscciation of Steam and Hot Water Fitters and Helpers of America, inclosing, for the indorsement of this convention, a copy of the engineers' bill, presented at their last national session, held in Cleveland.

The bill was as follows :

SECTION 1. No manufacturer or employer in this commonwealth having in their employ a person or persons whose duties are the care and operation of stationary (steam) engines or steam boilers, or both, shall exact from said employees any other work than the care of such engines and boilers.

SEC. 2. No person or persons whose occupation is the care and operatiou of steam engines and boilers, shall, while iu performance of that duty, perform any other work that will occasion them leaving their engine or boiler room.

SEC. 3. Any manufacturer, corporation, or person violating any of the provisions of this act, shall be punished by a fine of not less than $50 for each offense.

After discussion the bill was, on motion of D. M. Quay, referred to the incoming committee.

A motion was then made and carried, that the president appoint a committee composed of past members of the Executive Committee to make nominations for officers in the association; and the president having named such committee, another motion was carried to empower the Nominating Committee to make a recommendation as to the time and place for holding the next convention.

A. C. Walworth moved that the new Executive Committee consider the question of expediting the business of the next convention by having the papers printed and distributed prior to the opening of the convention. Mr. Kendricken moved in amendment that the time to be occupied in the reading of a paper be restricted to ten minutes. The amendment being accepted by Mr. Walworth, the motion was carried.

E. P. Bates of Syracuse, in reporting for the Committee on Standard Flanges, produced a flange made on the standard adopted by the last convention, provided by Jenkins Bros. With the aid of a valve he explained the features of the standard flange, the main feature being the drilling of the bolt holes equi distant from a line on the center of the valve stem. He also read a table of comparisons between the dimensions of standard flanges and ordinary flanges.

Mr. Walworth expressed himself strongly in favor of the standard flange.

Mr. Kendricken suggested that prints be published to show the fitter just what advantages he would get in the standard flange.

J. L. Wells of New York then moved that the association adhere to the standard for flanges adopted last year.

G. T. Coppins of the Walworth Mfg. Company expressed the desire of his company to meet the requirements of the standard flange in any reasonable way, but referring to the table of comparisons, he pointed out certain modifications which could be made so as to utilize certain patterns of ordinary flanges without detriment to the general principles of the standard flange, so far as thickness and diameter of material were concerned. A. C. Walworth then moved that the question of modification of sizes of standard flanges where they conflicted with manufacturers' sizes be referred back to the committee, with power to act in the matter.

The two motions being put to a vote, Mr. Walworth's motion was carried and Mr. Wells' motion rejected. The session then adjourned in order that all present might avail themselves of the invitation by the manufacturers to an excursion to Glen Island. It was arranged to hold the next session of the convention at 9 o'clock on Friday morning.

FRIDAY MORNING.

The convention was called to order at 10 a.m. The first business was the report of the Committee on Permanent Headquarters by E. P. Bates, chairman. The committee recommended that the headquarters should be in the city of New York.

J. L. Wells, as chairman of the Executive Committee, recommended that a committee of three be appointed by the president to draft a form of contract with special reference to the guarantee regarding zero weather, and that they report at the next convention.

Mr. Kendricken was of opinion that action should be taken at once and that a report be made in 90 days.

On motion, Mr. Kendricken's suggestion was added to Mr. Wells' recommendation and adopted.

The president called on a number of committees to report, but each report, together with other matters that came up for discussion, was held over for action in executive session. At 11 a.m. the meeting went into executive session.

The committee appointed for the purpose reported the following nominations for officers for the ensuing year, who were unanimously elected :

OFFICERS.

President, H. D. Crane, Cincinnati.
Vice-president, E. P. Bates, Syracuse.
Treasurer, E. D. Smith, New York.

EXECUTIVE COMMITTEE.

J. L. Wells, New York.
A. C. Walworth, Boston.
W. P. Thompson, Philadelphia.
John W. Danforth, Buffalo.
F. A. Williams, New York.

STATE VICE PRESIDENTS.

Illinois, J. W. Mills, Chicago.
New York, Jas. Curran, New York.
Ohio, —— Chafer, Cleveland.
New Hampshire, E. H. Randall, Concord.
Rhode Island, Jas. M. Smith, Providence.
Missouri, J. B. Hughes, St. Louis.
Delaware, A. Gawthorp, Wilmington.
Minnesota, Wm. Rodgers, St. Paul.
Michigan, Chas. W. Light, Saginaw.
Colorado, C. J. Reilly, Denver.
Washington, J. H. Griffith, Spokane.
Iowa, H. T. Ahrens, Davenport.
Wisconsin, Wm. K. Downey, Milwaukee.
Sergeant-at-Arms, H. A. R. Dietrich, South Bethlehem, Pa.

The committee recommended that the Executive Committee be authorized to fill vacancies by appointment whether such occurs by the loss of a vice president or because the convention has not elected a vice-president for any State, and also to fill vacancies in the committee.

It was decided that the next place of meeting would be St. Louis. but in case arrangements could not be made for holding the convention there it would be held in Cincinnati. The session adjourned at 1.30 p.m. to meet again an hour later.

Odd Items.

THE EXCITEMENT incident to the setting up of exhibits resulted in a laugh against a prominent exhibitor. Failing to find a suitable foundation for the tacks with which he was fastening his show card to the wall, he doffed his coat before renewing his efforts to secure a "tack hold." A neighboring boilerman came along and found it necessary to doff his coat also, and the only available place for depositing it being the spot selected by the P. E., the new comer's coat was laid upon the first. After the P. E. had adjusted his card he donned the boilerman's coat, and though its length was not exactly in proportion to his figure, he did not notice the change and wended his way upstairs. The boilerman having finished his labors, of course had no alternative but to accept the change, which proved all the more acceptable as a pocket contained a goodly roll of the "stuff" with which supplymen provide themselves before attending conventions It was possibly the need of this material which led to a speedy and satisfactory exchange and explanation.

IF ANY ONE failed to get one of the Smith & Winchester souvenirs it was through no fault of Newland E. Frost, their popular secretary. The souvenir was a donkey's head made of paper, on the balloon principle, with an air hole for inflating it. When

inflated, the head was supposed to represent the fitters' idea of a man who put in a furnace instead of a steam or hot water apparatus. Deflation of the head produced a wailing sound.

THE AMERICAN RADIATOR COMPANY'S parlors were well patronized throughout the convention and seemed to be the center of attraction for the lady visitors. Flowers in profusion perfumed the atmosphere of the rooms and there was a plentiful supply of flowers at all times at the disposal of the visitors, who were received by the representatives of the company.

THE HOLLAND RADIATOR COMPANY made a fine display of various styles of their radiators.

ONE of the most useful souvenirs of the convention was the fountain pen distributed by the American Boiler Company. Instead of the company's imprint on the outside of the pen, why not have had the "yell" of their enthusiastic representatives engraved on it? Here is the yell:

Who are we? Who are we?
The American Boiler Com-pan-ee!
With a hip-o. With a hip-o,
With a hip-o, hip-o he.
It's just as plain as plain can be,
The company that leads is the A. B. C.
With a hip o. With a hip-o,
With a hip-o, hip o he.

THE CRANE COMPANY of Chicago issued a 24-page pamphlet compiled especially for the convention and descriptive of their different establishments. The pamphlet contained many illustrations and was handsome in appearance.

THE HERENDEEN MFG. COMPANY, Geneva, N. Y., were represented by F. W. Herendeen, who took the opportunity afforded by the convention to further extend the company's trade connections. Besides furnishing fans for the comfort of those attending the sessions, the company distributed some handsome leather card cases which were much appreciated.

EDWARD F. KEATING, New York, had a goodly exhibit in comfortable parlors on the third floor. Brown's patent steam traps, Hoey & Conrow exhaust condensers, Hilt's chain pipe wrenches, Trim's pipe wrenches, Marsh's Acme air, steam and water valves were specialties prominent in the exhibit. Mr. Keating was in charge and had for assistants Jos. Keating, Thos. Lang, J. Irlbecher and Wm. Smith.

THE THAYER HEATER COMPANY of Boston had a fine exhibit of Thayer hot water heaters. The heaters presented an attractive appearance, being tastefully painted and decorated. John C. Hannemau represented the company and expounded the merits of the heaters, and the valuable features of the water top or auxiliary dome which formed part of the heaters. In use this top takes the place of the plain top and is connected with the supply and return pipes of the heaters and having a free circulation independent of the boilers it receives the full benefit of the products of combustion, as they are claimed to pass entirely over its exposed surface before reaching the indirect draft.

THE J. H. MCLAIN COMPANY of Canton, Ohio, were well represented among the exhibitors, having a fine exhibit, consisting of a No. 427 Cambridge steam heater and Harvard, Humber, Yale and Sandow hot water heaters. The Harvard and Humber were similar in construction, the Harvard, being intended for cellar use, having an additional jacket. The points in the Cambridge steam heater attracting most attention were the cone shaped water sections and the flared and corrugated fire pot. The peculiar shape of the water sections, it was stated, made the heater absolutely self-cleaning. Another point made was that the sections are all bolted together in milled joints on the outside of the heater, consequently no leakage could arise owing to the expansion and contraction of the fastening bolts. The heater burns either hard or soft coal.

THE DEANE STEAM PUMP COMPANY of Holyoke, Mass., exhibited a line of their steam pumps, consisting of a No. 2 boiler feed, in section; a 6 x 4 x 6 duplex, a 4½ x 2¾ x 4 pump and automatic receiver, and a 2 x 6 triplex electric power pump—a new pump which can be run from shafting or directly from a motor. The exhibit was in charge of John Mullan, W. S. Young and E. S. Denise.

THE IDEAL BOILER COMPANY of Chicago showed a No. 24 Ideal hot water heater, and Geo. E. Downe, the company's president, and H. E. Jones, the New England representative, enumerated the good qualities of the heater and drew attention to its deep corrugated fire pot having a true taper, to its unobstructed waterways and its positive and quick circulation. A leading point was that when it was required to increase the capacity of the heater additional sections could be added.

THE FOSKETT & BISHOP COMPANY of New Haven, Conn., exhibited on the main floor a small model of the G. & J. R. Bolton heaters.

J. P. DUGGER, secretary of the Keewanee Boiler Company, Chicago and Kewanee, was in attendance, and looked after the interests of his company.

WHEN BONNIE THORNTON, at the entertainment at the Madison Square Roof Garden, said: "All you steam and hot water fitters throw your money on the stage for the Sick Babies' Fund," who threw one of the Chinese coins forming part of the Ideal Boiler Company's Souvenir?

THE RICHMOND STOVE COMPANY, Norwich, Conn., were snugly ensconced in Parlor 334. They had no exhibit, preferring to take advantage of the display of Richmond steam and hot water heaters to be found at 85 Centre street, the house of their New York agents, A. A. Cryer & Co. Callers were received by B. E. Mallory, Norman Whitelaw, Frank Whitelaw, Geo. W. Clark and Chas. F. Hauss, who also extolled the merits of Richmond steam and hot water heaters and made presentations of elegant souvenirs in the shape of Peacock cigar ash receivers and a combined paper weight and match box bearing the form of a turtle.

THE JOHN SIMMONS COMPANY, 110 Centre street, New York, dealers in pipe and fittings and general supplies, distributed souvenir glass pens, neatly put up in wooden cases, which were very acceptable to all fortunate enough to secure them.

"IT'S SWEET to be remembered," remarked E. N. Squires, the popular secretary and manager of the New York Central Iron Works Company, Geneva, N. Y., manufacturers of the well-known Dunning boiler, as he presented to every one with whom he came in contact a small bottle of Lundborg's perfume, bearing a label embodying the compliments of his company. He also distributed a neat little leather *portemonnaie* bearing the company's card and the motto: "Good 'cents' and dollars buy the Dunning boilers."

HART & CROUSE of Utica, N. Y., were among the leading firms without exhibits, but their exhibitions at previous conventions and their reputation insured them many visitors to their parlor. W. M. Mackay, David Miller and H. L. Anderson showed an aluminum model of the Royal heater and dispensed "royal" cigars, the two forming a happy combination, as it is whispered that second calls were made. Mackay's quick opening hot water valve was on view and its utility discussed.

THE CRANE COMPANY of Chicago, Philadelphia and New York, utilized Parlor 212 for the entertainment of all who accepted their cordial invitation to call and see them. G. Frank Ubler and Waldron Moore, the company's New York representatives, were most assiduous in their attentions and extended the reputation enjoyed by the company.

THE UNITED STATES HEATER COMPANY of Detroit had no exhibit, but Second Vice-President J. W. Mills and Eastern Representative J. L. Saunders were at home in a third-floor parlor and extolled the virtues of the Capitol hot water, Hecla steam and Mascot steam and hot water heaters. "Forty sizes of boilers with forty different sized grades" was one of the impressions carried away by visitors. Another was a neat little match safe of vulcanized rubber, the appreciation of which was shown by its service throughout the convention.

Exhibits.

THE GURNEY HEATER MFG. COMPANY of Boston had a very large exhibit in the basement in charge of Vice-President John A. Fish, assisted by J. G. Forrest, Charles Morrison, J. G. James, W. T. Isaac and James P. Shoop, all popular salesmen of the company. The exhibit comprises a No. 305 Gurney heater, a Gurney double crown hot water heater and a No. 4 and No. 5 Gurney steam boiler, the latest production of the company and recently described in *The Metal Worker*; Gurney radiators and the Yale, a new radiator just brought out by the company. The latter attracted much attention Mr. Fish described it as the largest radiator loop occupying the smallest space ever introduced, and very valuable where it was necessary to put much in little space.

* * *

JENKINS BROS. of New York, Boston, Chicago and Philadelphia occupied two rooms on the parlor floor, where A. B. Jenkins with J. D. Stiles, H. G. Logan and Mr. Utz entertained callers. Their only exhibit was a line of valves with the standard flanges adopted by the American Society of Mechanical Engineers and the Master Steam and Hot Water Fitters' Association. This was the first public appearance of valves having the standard flanges, and the firm are to be complimented upon their enterprise. They have a full line of patterns and are able to furnish any size called for.

* * *

THE NASON MFG. COMPANY, 71 Beekman street, New York, were exhibitors of their new Nason shaking grate. Chas. Yingling represented the company and explained the principles of the grate and its ability to thoroughly shake a fire, stir the ashes and break clinkers or cinders and pass them through to the ash pan.

* * *

RAYMOND & CAMPBELL MFG. COMPANY.

Conspicuous on account of its polished Russia iron jacket and dainty white trimmings was the Sun boiler, exhibited in the basement by the Raymond & Campbell Mfg. Company of Middletown, Pa. At the head of the stairs leading to the basement was displayed a large card bearing the legend, "The Sun lights the way—take a few rays." The "rays," suspended in rows, were *facsimile* testimonials received from users of the boiler, each testimonial on a separate sheet of convenient size. The stand was in charge of Harry H. Lindemuth, the inventor of the boiler, and Alex B. Johnston, the manager of the New York office of the company, who practically explained how "the Sun do move."

* * *

POWERS DUPLEX REGULATOR COMPANY.

P. MacCallum represented the Powers Duplex Regulator Company and showed the company's regulator as applied to hot water and hot air heaters and hot water tanks. He also showed their device for operating dampers or valves in flues of indirect hot air systems, both with furnace and forced draft, as used in schools, colleges, churches and hospitals.

* * *

THE A. J. BENNETT PATENT RADIATOR ATTACHMENT COMPANY

were represented by A. J. Bennett, who exhibited their Comfort foot rest for direct radiation and their new foot bracket for indirect and furnace heat. The Bundy radiators in the room were used to show the devices to advantage, and the comfort suggested by them was appreciated by all who saw them. The foot rests are made of malleable iron, neatly bronzed or nickel plated, and have upholstered plush rolls or heel supports. They are furnished with couplings to suit any style of radiator on

the market. Catalogues describing the devices were in demand aud a plentiful supply afforded.

* * *

THE EATON, COLE & BURNHAM COMPANY

of New York were located in the basement and showed a line of globe, gate and radiator valves and a general line of steam and hot water fittings and fitters' tools. Prominent in their exhibit were a 14-inch by-pass gate valve, guaranteed to stand 500 pounds steam pressure, for use in power houses and places where extremely high pressure is required ; a 4-inch pipe machine, and a 2-inch Gem nozzle for fire purposes. The stand was in charge of Geo. E. Walton and Nelson Mervin, the Eastern salesman.

* * *

TIMOTHY KIELEY,

7 to 11 West Eighteenth street, New York, was on the main floor near the office with a line of steam heating specialties covering the Champion return steam trap, high pressure regulator, oil separator, Standard trap, Eureka pressure regulator and positive acting pump governor.

* * *

THE FULLER & WARREN COMPANY

of Troy, N. Y., occupied a prominent position in the basement, where they showed their No. 26 double section self cleaning hot water hoiler and their No. 15 hot water boiler, the latter largely used by engine companies as superbeaters. They also showed the hot water section used in their combination warm air and hot water furnaces. The arrangement of this section is quite simple. The water entering the boiler is compelled to pass entirely around and over the top of the fire before reaching the cross section, through which it flows and is connected with the next section, in which the same surface is traversed. The flow continues until it reaches the top, where it is distributed by the flow pipe to the different radiators, from whence it is returned to the bottom of the boiler and again circulated. One or more sections may be used according to the requirements, and any section may be tapped to accommodate from a 2-inch to a 3-inch flow pipe. The bottom section is of horseshoe shape tapped for two 2-inch pipes. The exhibit was in charge of R. S. Wood, the secretary and general manager of the company, and J. J. Wilson, the company's heating engineer.

* * *

THE SMITH & WINCHESTER COMPANY

of Boston showed their No. 12 Winchester boiler, lately placed on the market. It is a sectional cast iron boiler with screwed joints, and embodying a large amount of heating surface over and around the fire. It has an anti-clinker rocking and dumping grate and nickel plated trimmings, and is tapped for return in hoth sides and rear, in order that returns may be easily run no matter in what position the boiler is placed. The diaphragm of the damper regulator is connected hy a special fitting to insure cold water contact with the rubber. The stand was in charge of Newland E. Frost, the secretary of the company.

* * *

THE MODEL HEATING COMPANY

of Philadelphia were exhibitors of the only boiler in practical operation. This was their new No. 235 Novelty steam generator. In front of the hoiler was a pyrometer attached to a rod passing over the fire, recording the temperature of the combustion chamber. A thermometer at the smoke outlet showed the temperature of the products of combustion when passing out of the boiler. This was to demonstrate the efficiency of the fire surface. A section of the boiler showing the fire surface was also exhibited. A. C. Edgar and M. B. Moore represented the company and intelligently explained the features of the exhibit.

* * *

THE PACIFIC MFG. COMPANY

of 471–473 Eighteenth street, Brooklyn, had a stand on the main floor near the office, where they exhibited the Nelson valves. W. G. Nelson and G. F. Batt were in charge, and explained the working of the compensating disks in the valves. As this was the first appearance of the valves on the market they naturally attracted a good deal of attention. A feature of the exhibit was a valve made of alumiuum, and intended for a traveler's sample.

* * *

A. A. GRIFFING IRON COMPANY.

At No. 201, on the parlor floor, a pair of parlors accommodated the A. A. Griffing Iron Company of Jersey City, N. J.; the Powers Duplex Regulator Company, 36 Dearborn street, Chicago, and the A. J. Bennett Patent Radiator Attachment Company, Wconsocket, R. I. The A. A. Griffing Iron Company showed a line of their Bundy radiators and radiator fittings. They also showed a new pipe hanger haviug a side hinge which, it is claimed, allows of the strength of the hanger to center where the weight of the pipe is located, and a quick opening hot water radiator valve. The interests of the company were looked after by Thomas H. Williams, president, assisted by L. B. Sherman, C. F. Lathrop, John Sabin, John De Barthe, Leonard Elliott, T. Mason and Frank Somers.

* * *

THE SMITH & ANTHONY COMPANY

of Boston, Mass., occupied the coolest place in the basement with their Hub boilers. They exhibited a No. 20 hot water boiler, and No. 118 steam boiler in sections. S. F. Terwilliger and E. W. Fiske, the assistant secretary of the company, were in charge and drew attention to the overhanging fire pot, which brings the water immediately over the fire and concentrates the heat under the crown sheet section. The inclination of the water from the start, it was explained, is upward and from center to sides, and back to center, circulating through every section.

* * *

THE WALWORTH MFG. COMPANY

of Boston had a well arranged and extensive exhibit in parlor No. 330. It consisted of steam and hot water valves for fire purposes, sprinklers, pipe tools, stocks and dies, Stilson wrenches and all kinds of steam and hot water fittings. As novelties they showed a new combination uuion elhow and valve ; the F. P. ball cock, which, it is stated, is absolutely noiseless and will in any size take a 4-inch ball ; and the Ashley patent nipple holder. G. T. Coppins, the secretary of the company ; E. P. Keen and W. P. F. Ayer were in attendance.

* * *

THE KENNEDY VALVE MFG. COMPANY,

52 Cliff street, New York, made a very nice showing with a line of their extra heavy gate valves, brass and iron globe and angle valves, radiator valves, straightway and quick opening valves. The exhibit was in charge of President D. Kennedy, P. Hartenfells and E. F. Koons.

* * *

THE SPRINGFIELD COIL BOILER COMPANY.

An exhibit attracting a good deal of attention was that of the Springfield Coil Boiler Company of Springfield, Mass. It consisted of a model of large size showing the construction of the boiler. O. D. Adams, the president of the company, and J. Leon Guyon, the New York agent, imparted information regarding the boiler and explained that the hot water enters the lower coils, passes around the fire box into a supply standard which distributes it into the upper coils, whence it passes into column and thence into the steam drum, through the pipes and back to the boiler. The grate is novel, having a reverse action to destroy coning in the center, a common source of annoyance.

* * *

THE BOYNTON FURNACE COMPANY

of New York and Chicago had the largest exhibit in the convention. It consisted of a No. 23 hot water boiler for hard coal, a No. 207 hot water boiler for soft coal, a No. 506 and a No. 608 steam boiler, a No. 48 hot water boiler for hard coal, all of the Boynton line, and three Ningara boilers. An idea as to the ease with which these boilers are set up may be gathered when it is stated that they arrived in parts and were set up completely hy three men in 11 hours. The interests of the company were ably looked after by A. B. Marshall, C. F. Armitage and Jos. Smith.

* * *

THE WM. H. PAGE BOILER COMPANY,

Norwich, Conn., were represented hy G. H. Weymouth, who exhibited a No. 1 and No. 8 hot water and No. 8 steam boiler of their Volunteer line. Particular attention was bestowed ou the No. 1 hoiler, it having their automatic regulator attached. The regulator consisted of a cast iron drum extending from the top of the boiler to the hottest part of the water without coming in contact with the fire. The drum is filled with water independent of the water in the system, the water by expansion operating a rubber diaphragm. The boilers were without ornamentation of any kind and just as shipped from the factory.

* * *

THE THATCHER FURNACE COMPANY

of 240 Water street, New York, and Newark, N. J., showed their No. 4 Champion steam heater, the size suitable for 300 feet of direct radiation. It is a horizontal tubular boiler in connection with a cast iron sectional fire box. An advantage in its construction is claimed to be the large combustion chamber for expansion of the gases, allowing them to become thoroughly ignited before going to the heating surface. The heat passes from the combustion chamber through the tubes, and by baffle plates is made to pass over the shell of the boiler before reaching the smoke pipe. The boiler is easy to clean, the tubes being reached from the front door, and it may be cleaned when under fire. Any kind of fuel may be used. The boiler was shown and its principle explained by G. H. Hersey.

* * *

BLAKE & WILLIAMS,

186 and 188 South Fifth avenue, New York, dealers in steam and water heating and ventilating apparatus, were located in a suit of rooms on the third floor, and exhibited Blake's hot water thermostat and a line of Blake's patent malleable iron adjustable pipe haugers John L. McMann, the firm's heating engineer, and Matthew Duff proved to be able representatives of the firm and received many callers.

The Entertainers.

The entertainment of the delegates was, as usual, taken in hand by the representatives of the manufacturers assembled at the hotel. On the morning of the first day of the convention the meeting was called to order by R. D. Reed, after which Major E. R. Pierce was elected chairman and L. H. Hart secretary. The principal business before the meeting was the appointment of committees on entertainment and finances. The following is the committee appointed by the chair on entertainment:

L. D. Sherman, A. A. Griffing Iron Company.
R. D. Reed, H. B. Smith Company.
J. D. Stiles, Jenkins Brothers.

The Finance Committee was composed of

A. F. Gartz, Crane Company.
F. A. Herendeen, Herendeen Mfg. Company.
Scott Coppin, Walworth Mfg. Company.
George Downe, Ideal Boiler Company.
William H. Hill, American Radiator Company.
C. A. Lathrop, A. A. Griffing Iron Company.
D. Paul Hughes, Standard Radiator Company.

Entertainments.

On Wednesday evening the delegates and their ladies attended a concert in the Roof Garden at the Madison Square Garden, at the invitation of the manufacturers, where an excellent programme was provided.

On Thursday the delegates and their friends, as the guests of the manufacturers, enjoyed a delightful excursion to Glen Island. The party, numbering 250, left the hotel shortly after 1 p.m. in omnibuses placed at their disposal, and boarded the steamer "Laura M. Starin," and accompanied by a band of music proceeded to the island, which was reached after a pleasant sail up the Sound, extending over two hours. Some little time was spent in the enjoyment of the attractions of the island, and at 6 o'clock the company were conducted to the dining pavilion, where an excellent repast was provided. The following was the bill of fare:

Clam Chowder.
Sliced Cucumbers. Sliced Tomatoes.
Olives.
Steamed Clams,
Hard and soft shell.
Baked Bluefish. Clam Fritters.
Boiled Lobster.
Broiled Spring Chicken.
Asparagus. Boiled New Potatoes.
Ice Cream.

At the conclusion of the repast Mr. Pierce of the American Radiator Company, on behalf of the manufacturers, in a few well chosen words expressed the warm feelings of regard held by the manufacturers of the various articles daily used in the steam and hot water fitting business toward their guests, and the gratification it afforded them to extend some little hospitality. In the course of his remarks he said that in spite of the tremendous financial storm which the country had suffered the manufacturers recognized the fact that during that time the master fitters of the United States had been exceptionally able, compared with other business enterprises, to pay their bills with 100 cents on the dollar. He eulogized their skill as mechanics and their home life, as exemplified in the presence of so many wives and daughters with them at the convention.

President Rutzler, on behalf of the National Association, thanked the manufacturers for their kind sentiments and for the entertainment which they provided so liberally at these conventions.

Geo. T. Coppins of the Walworth Mfg. Company, Boston, acceptably filled the office of toastmaster.

The first toast was "The Master Steam and Hot Water Fitters' Association of the United States," which was responded to by A. B. Franklin of Boston. The next toast was "The New York Local Association." to which J. L. Wells responded. "Our Guest from England" was the third toast and it met with a hearty response by Mr. Nesbit. The fourth and last toast was "The Ladies," the duty of responding to which devolved upon D. M. Quay.

The company then embarked on the steamer for the return trip, the vessel reaching her wharf at about 10.30 p. m., from whence omnibuses conveyed the party to the hotel, where the opinion was freely expressed that a more delightful outing could not be imagined.

THE MODEL HEATING COMPANY send out a card announcing that they have opened an office in the Builders' Exchange, Room 303, 24 South Seventh street, Philadelphia, where they will be pleased to see their friends.

The Difference in Amount of Radiation Required in Buildings of Good and Poor Construction.*

BY E. P. BATES.

To illustrate the subject before us I will recite my experience in several buildings. In the fall of 1879 I placed a low pressure steam heating apparatus in a building designed for a home for old ladies. Many of the rooms were small, and in order to warm them without question a radiator was placed in each room. Knowing that a high temperature would be agreeable, the calculation was made that 1 foot of radiation would warm 40 cubic feet of air. This we considered very liberal when the fact that we used the Gold sheet iron radiator is taken into account. We were, however, doomed to a very serious disappointment, as the temperature in the rooms on the windward side of the house frequently fell to 50° and sometimes even below during severe cold and windy weather. After reconsidering all the conditions we determined to add a large percentage of radiation, which was done, and the building has been thoroughly warm ever since. The amount of radiation added in many of the exposed rooms was from 50 to 100 per cent. over that originally supplied. To my mind the rooms in this building are very uncomfortable, for the excessive amount of radiation required to maintain the temperature produces a very disagreeable condition of affairs, together with the excessive loss of heat through the thin walls and many air leaks. It was soon found that although the ratio of radiation was very excessive, under the existing conditions the condensation was very rapid, and more boiler power was required to maintain the steam pressure. Consequently an additional boiler was supplied at the expense of the heating contractor, which gave plenty of generating power, but all this was accomplished at a heavy proportional loss to the contractor. To my mind, as I review the entire matter, I find that the original calculations for boiler and radiating surface were correct, providing the building in question had been ordinarily well constructed. But from subsequent surveys I conclude that the architect and building contractor produced about as poor a specimen as it was possible to do and have it stand up as a public building. The result is that the amount of fuel needed to warm the building is enormous.

HEATING A COLLEGE BUILDING.

I have in mind another building which belongs to one of our popular colleges. This building was constructed in 1872. The location was on the brow of a high hill, where the front was exposed to the force of the northwest winds. It was the intention of the heating contractor to make this building very warm, and all calculations were made with this object in view. After the apparatus was complete and the weather became cold it was found that many of the small rooms in the west front did not warm to the required temperature, and an investigation was made to determine the cause if possible. We referred to our calculations as to boiler, piping, radiating surface, &c., and found that the apparatus was constructed according to our calculations; nevertheless we were confronted with a number of cold rooms. We finally determined that the only way to satisfy ourselves was to live in the building and keep a record of the temperature, both in the rooms and outside. While this was in progress I visited the building one very windy day, and in entering some of the west rooms I was surprised to find that the hall door would be pulled away from me and shut with a report like a gun. I supposed at first that a window was open, but examination showed that they were closed as tight as possible considering their construction, but the air leakage was enormous, and a large quantity of air was constantly driven through the brick walls of the building. In fact, the volume of air forced into the rooms was so great that the hall door was opened with difficulty. The radiators in these rooms were liberally increased, and the warming of the building has been very satisfactory to its occupants. The heating contractor in this case did not meet with a decided loss, as a very liberal allowance for the exposure of the building had been made in the original calculations.

A STATE NORMAL SCHOOL.

Another striking case comes prominently before me. About eight years since I placed the heating apparatus in one of our State normal schools. The building was in a very exposed location, and the radiating surfaces were very carefully apportioned in order to fully meet all conditions. One large class room, containing about 100,000 cubic feet, was provided with 1 square foot of radiation to 40 cubic feet of space. This was thought to be excessive at the time, but we wished to do the work right the first time, and not have alterations or additions to follow the work, so the full amount of radiation was supplied. When the weather became severe this room was very cold, and radiating surface was added at various times until the ratio was brought up to 1 to 18 and the desired temperature secured. The larger part of the radiation was direct—in fact, all radiation which was added was direct. I found that while standing in the room during a severe northwest wind you could feel the wind on your face as it came through the wall of the building. In the illustrations cited the buildings were very carelessly constructed, the architects in charge giving very little attention to the minor details which have the most important bearing in the comfortable use of the building. I will now call your attention to the reverse of the conditions named above.

AN OVERHEATED RESIDENCE.

Last year I contracted to place a small hot water apparatus in an old residence which was being altered slightly and converted into a small apartment house. The building was not badly exposed, so the calculations were based on a moderate amount of radiating surface. The apparatus was complete in the fall and the tenants moved in. The fire had been started but a few days when there was a general complaint of too much heat, especially in the bedrooms. I found that the latter contained about 1500 cubic feet and a radiator of 32 square feet was used to supply the heat. Our advice was to shut the valve on the radiator and run the water at a lower temperature, and when very cold weather came they would be very happy with nicely warmed rooms. Our suggestions were partly followed, but the complaints of overheating were almost constant, and after passing partly through the winter both owner and tenants demanded that all the radiators be removed from all the bedrooms at least. This was done, and there remained in these rooms a riser of 1¼-inch pipe, which contained about 4½ square feet of radiating surface in a room of 1500 cubic feet, or a ratio of 1 to 333, the bedrooms being outside rooms. I have never had the opportunity to examine this house, but there is no doubt as to its good construction. I might further say that I am advised that the temperature of the water is kept down to 140° to 160° in the coldest weather.

A WELL CONSTRUCTED STABLE.

A few years since I built a small stable. Its dimensions are 24 x 36 feet on the ground. The ground floor is used for a carriage room, horse stalls, harness room, &c. In practice the floor is commonly used as one room. Above is a hay loft, with a room for the driver over the harness room. To my mind it is desirable to keep the stable moderately warm through the winter and to accomplish this with a moderate outlay in apparatus and fuel. Over the horse stalls is a ventilating pipe running through the roof; this pipe is 12 inches in diameter and is always open, summer and winter; usually the air is going through it at a high velocity. There is no especial provision to bring air into the stable, but the doors and windows are ordinarily well fitted, and there are large leaks about the entrance to carriage room, which has a sliding door about 9 feet square and opens to the north. In using the stable no difficulty was found in warming it to 60° in the most severe weather, and an ordinary globe stove was used with a grate 8 inches diameter. The amount of fuel used per season is between 3 and 4 tons. The stove pipe passes through the driver's room and the heat given out by the pipe maintains a comfortable temperature in that room. I believe this stable is more comfortable in summer and winter than the average

* Read at the sixth annual convention of the Master Steam and Hot Water Fitters' Association of the United States, New York, June 19-21, 1894.

stable, although many of them may be much more expensive in construction. The stable is built of wood, the frame is balloon style, the upright studs are 2 x 4 inches set about 16 inches to centers. On the outside of these studs I placed a course of rosin sized paper and one thickness of coved siding. In order to prevent the buckling of the paper at the laps and to prevent a rapid change of circulation of air between the studs, I placed a 2 x 4 inch lengthwise (between the upright studs) on the sill, then once in 3 feet cut in a 2 x 4 inch as an addition girth. The paper being a yard wide abutted on this extra girth, which held the edges tight and prevented the circulation of air from cellar to hay loft, and *vice versa*. On the inside of the carriage room, as well as other rooms on the ground floor, a course of building paper was used and ceiled over with ⅛-inch narrow Canada pine for a finish. Under the floor of the hay loft was laid a course of building paper, also on the ceiling of carriage room before the ½-inch wood ceiling was laid. At the top of carriage room where the studs and joist join I stopped off with boards to prevent circulation of air. The idea of using the cross girths once in 3 feet and buildiug paper ou the inside of the walls was very amusing to the old carpenters employed on the work, hut it is very satisfactory on a cold day and equally so in hot weather, the building being much more comfortable than many dwelliugs which are built at a much greater cost per cubic foot. It will be noticed that the stable here described is of very inexpensive construction, and would be very cold in winter and hot in summer except for the succession of dead air spaces in the walls, cove siding being one of the poorest materials for keeping the wind from penetrating a huilding.

HOW A HOUSE WAS BUILT.

Believing that I was correct in theory, I determined to carry out my ideas more carefully in the construction of a house two years since. This house stands alone, fully exposed on all sides, on high ground in Syracuse, where the temperature frequently falls below zero and occasionally 15° to 20° below zero. It is constructed of wood and is comparatively inexpeusive. The frame is what is known as balloon with slight modifications. On the outside of the frame are placed hemlock hoards planed on one side, and over the hemlock is placed a course of heavy building paper, care being taken to leave no bare places or uncovered knot holes, also that the paper fitted properly arouud all corners, windows and door frames. A 2 x 4 inch was nailed to the sill to prevent the air from cellar going to the attic, or *vice versa;* once in 3 feet a cross girth 2 x 4 inches was cut in between the upright studs to make a dead air space in the walls. This was also done in the partitions. At the ceiling of each story a board to fill the space between the joist was inserted ; said board was covered with building paper. Over the partitious in the center of the house a stop off was inserted in a similar manner to preveut the air from passing from side to side of the house and cooling the ceilings of the various rooms. The roof boards were covered with paper before the shiugles were laid. Every point was carefully looked after to prevent air leaks, the object being to get dead air spaces in all the walls as far as it was possible to do this.

THE HEATING APPARATUS.

The next point was to install a good warming apparatus, aud after having the old saw about shoemakers' wives and blacksmiths' horses handed to me several times I determined to erect a heating apparatus which would surely warm the house every day. I therefore placed in the house a Bates self-feeding boiler No. 6, containing 103 square feet of fire surface. This boiler is brick set. Allow me to speak of a peculiarity of this boiler. Quite different from many which are advertised, it does not save any coal. They will burn all you fire into them, but if the firing is done with any reason the boiler will give you an equivaleut in heat for every pound of fuel it consumes. The house in question being three stories, it was decided to make a combination apparatus—*i.e.*, hot water and steam, using hot water stacks for the five principal rooms and steam radiators for bath, back hall and the small bedrooms. The hot water was circulated from the water line, the boiler being set in the usual way for carrying steam, with automatic water feeder, automatic draft door, &c. I placed in the house, which contains about 16,000 cubic feet of space, 457 square feet of radiation, equal to 1 square foot to 33 cubic feet of space to be warmed. Of the above 350 feet was in the indirect hot water stacks and 127 square feet distributed in seven small radiators. For ventilation I built one chimney stack, which connects conveniently to most of the rooms. In this chimney stack I placed eight tile flues made of vitrified pipe without hubs, aud all 8 inches in diameter except the flue for the fire place in dining room, which is 10 iuches in diameter. These flues are used as follows: One for steam boiler, one for laundry stove, one to ventilate laundry, being three in basement; on ground floor one for fire place, one for range, aud one for hood over range to take off heat and vapor from cooking, being three on ground floor. On the second floor there is one flue from the large bedroom, at the base of which is set a Franklin stove, and the other and eighth flue in the hack hall. The bathroom being several feet away from the chimney has a separate flue of tin and galvanized iron extending through the roof independeutly with a Globe ventilator on top. Every test made shows each flue carrying out a large amount of air, and those flues to which fires are connected are very satisfactory, in fact they never fail to draw, and the course or velocity of the wind seems to make no difference, so it is evident that a rapid change of air is going on constantly.

RESULTS.

As to results. When the thermometer registered 5° below zero during the past winter we used one stack of pin radiators in the reception hall. Said stack coutains eight sections. The register over the other stacks were kept closed, a radiator of 16 square feet in back hall of second floor was filled with steam, and a radiator of 18 feet on third floor was partly filled equal to 10 square feet, or in all 108 square feet in active operation in severe weather. There is no doubt that we receive some benefit from the stacks where the registers are closed, as there is a small percentage of leakage through the registers, and some heat given off by the tin flues running to the upper rooms. If only 108 feet were used the ratio would be 1 to 135. After having several cold days and demonstrating the fact that the amount of radiation was greatly in excess of the amount which could be possiby used, radiators were removed from the house to the amount of 86 feet of direct radiation and 60 feet of indirect, the latter being the stack placed to warm the drawing room and was not used, as the room was thoroughly warmed by the hall stack. It was found also that during the coldest days and evenings it was comfortable to sit in auy part of the house, even the rooms where the registers were closed; also that the difference in temperature between the outside and partition walls was slight. One fact worth mentioning is that the bathroom was in constant use, and that it was designed to heat it by means of a brass coil, uickel plated, containing 20 feet of 1-inch pipe, but the valve was not opened during the winter, the room being comfortable at all times to take a bath. During this season it is my intention to extend the tin flues to three bedrooms from which the direct radiators have been removed, as the stacks are abundantly large to supply them with heat. I might say in explanation that I should not have carried heat enough to raise steam, but for the fact that one of the upper rooms was used for a sewing room, and steam was required to reach that room. In my opinion I shall not need to carry the water above 180° the coming winter to perfectly warm the entire house. Under the conditions here described the boiler ran with the miuimum of care, the draft door remaining constantly closed days at a time; the grate was shaken once in 24 hours in the most severe weather, and only once in 72 hours in very mild weather. With a temperature of 32° outside, water at a temperature of 110° to 120° at the boiler was sufficient.

THE APPLICATION.

The question may now be asked, what has all this matter of constructiou to do with our craft? We do not build houses or other buildings—we must take them as we find them, good, bad and indifferent, and place in them a heater that will fill our guarantee, be it more or less. This is a fact from one standpoint ; there is, however, another view to take of the subject. Every trade is responsiable for existing conditions to a certain extent. By agitating a subject we briug about reforms, and if $15 to $40 judiciously expended in the construction of a small residence will save the full amount in the value of fuel in one or two seasons and add largely to the comfort of the occupauts all the time, our efforts are well expended in diffusing the kuowledge of the fact, and intelligent inquiry will he well rewarded in its research. Further, we all make our great successes in well constructed buildings, and our failures and sometimes losses in those of poor construction. With this in view I hold that it is largely to the interest of the steam fitter and heating engineer to promote in every way possible the desire which the owner aud architect may have for a well constructed building. "Continual dropping wears the stone."

"FOOD FOR THOUGHT" is the motto on the outside of a miniature meal bag that rouses the curiosity. Further investigation reveals a circular within this little receptacle telling about the Ideal boiler made by the Ideal Boiler Company, 36 Dearborn street, Chicago.

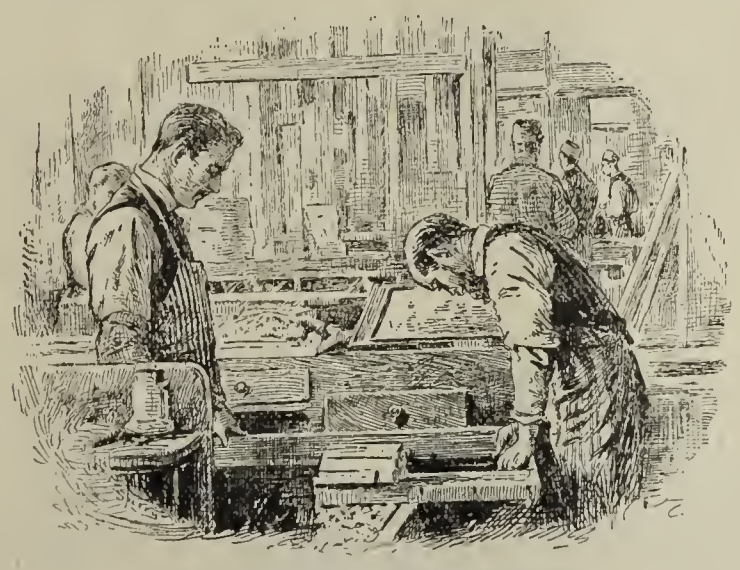
Wire Ropes.

At a recent meeting of the Yorkshire College Engineering Society, in England, Herbert Cheesman of the Hartlepool Ropery Company, Hartlepool, England, read a paper on "Wire Ropes," of which the following is an abstract. After describing the general construction of wire ropes, the lecturer urged the necessity of using wire having the same modulus of elasticity throughout one rope. The object of all rope manufacturers is to obtain an ultimate strength for the whole rope equal to the sum of the strength of the separate wires, and the only way of attaining this result is to use material of precisely similar elastic properties. Another very important point brought forward was the initial torsion given to each wire in the formation of the strands by the "sun and planet" mechanism. This system of preparing the strands is very generally supposed to prevent any twist being given to the separate wires, but it was clearly demonstrated that a slight axial rotation of each wire is necessary to entirely prevent any torsional stress being put upon them. Mr. Cheesman has now brought out a machine which enables the operators to adjust this axial movement to the requirements of the lay of the strand. In speaking of the rotation of wire ropes, Mr. Cheesman pointed out that all long ropes not of a perfectly cylindrical form must necessarily rotate, though they may be fixed at both ends, for they always tend to follow the path of the greatest bearance, which is down the spiral of the rope. This tendency increases with the weight lifted, and he had observed that by raising a kibble empty it made five revolutions, while with the weight of two men it made 11, and when filled with earth 19. The rotation of the rope is advantageous in equalizing the wear. Illustrating the advantages of internal lubrication, Mr. Cheesman quoted the experiments of A. S. Biggart. An unlubricated rope stood 16,000 bends before fracture commenced, while the same rope when lubricated stood 38,000 bends over the same pulley. Another similar test showed that the life of the rope was just doubled by internal lubrication.

The engines of the new United States cruiser "Cincinnati" were given a dock trial last week in the Brooklyn Navy Yard, with very satisfactory results. The "Cincinnati" was designed and built by the Government. Her engines develop 10,000 horse-power and are expected to make over 20 knots on her official trial.

A Visit to a Stove Foundry.

A modern stove foundry is a very complex institution. According to a high authority no less than 25 trades are represented in such an establishment. They comprise designers, modelers, wood pattern makers, plaster workers, iron pattern makers, polishers, electro platers, buffers, carpenters, follow board-



A Corner of the Wood Pattern Shop.

ers, japanners, casting scratchers, floor molders, bench molders, cupola melters, grinders, mounters, inspectors, tinsmiths, sheet iron workers, brass workers, blacksmiths, flask makers, pipe fitters and machinists. These are by no means forced classifications, with groups of workmen who are sometimes craftsmen of one sort and then of another. Every man employed has a special function in which he is as far as possible an expert. Such an explanation is a necessary preliminary to a description of the art of stove founding as conducted according to the most approved methods of the day. For this purpose the works of The Michigan Stove Company, at Detroit, Mich., have been selected.

Before entering upon technical details, a brief history of The Michigan Stove Company will be of interest, as showing the origin and growth of the establishment which now occupies so prominent a position in the stove trade. The organization of the company dates back to 1871, when articles of incorporation were taken out by Charles Du Charme, Jeremiah Dwyer, Merrill I. Mills and R. H. Long. The central figure in this group of persons was Jeremiah Dwyer, who was the pioneer stove manufacturer of Detroit, having founded in 1862, before the incorporation of any of the present Detroit stove companies, the firm of J. Dwyer & Co., exclusive manufacturers of stoves and ornamental castings. Ground was broken on the present site of the works in March, 1872, and the first heat was taken off in the foundry on September 12 following. The officers of the company at that time were as follows: Chas. DuCharme, president; M. I. Mills, vice-president and treasurer; Jeremiah Dwyer, manager; R. H. Long, secretary. In 1873 George H. Barbour was elected secretary to succeed Mr. Long, who became superintendent, holding that position until his death on April 3, 1876. Charles DuCharme died January 9, 1873, and was succeeded as president by Francis Palms, who held the position until his death in November, 1886. In August, 1872, M. B. Mills became associated with the company and was elected a director in 1878. Charles A. DuCharme entered the company in 1879 and became a director in 1882, when he was also made purchasing agent. The Chicago house was established in January, 1879. On January 1, 1882, Frederic W. Gardner became associated with the company, assuming the management of the advertising department and Western business. The officers of the company at present are as follows: Jeremiah Dwyer, president; George H. Barbour, vice-president and general manager; Merrill B. Mills, treasurer; Charles A. DuCharmet secretary; William A. Dwyer, purchasing agent; William J. Keep, superintendent; Frederic W. Gardner, Chicago. Western manager. The present directors are as follows: Jeremiah Dwyer, George H. Barbour, Charles A. Du Charme, Merrill B. Mills, Francis F. Palms, William A. Dwyer, Edwin S. Barbour 2d, M. W. O'Brien and Frederic W. Gardner. The capital stock of the company was originally $100,000, and was increased at various times until it is now $300,000, but the actual investment in the business is about $1,000,000. The pay roll in 1892, which is taken as an average year, was $595,974, and 75,699 stoves were made. The quantity of pig iron melted in that year was 11,632 tons. The average number of men employed is 1200, and they are kept at work as far as possible every working day in the year to secure the best economical results.

Coming to the methods of manufacture pursued in this establishment as typical of modern practice, the starting point is naturally in the designing room. The high class stoves of to-day not only require the most expert workmanship in their construction, but they compel the employment of creative genius of a peculiar character. Artistic talent must be united with practical ideas. The first step taken is to decide upon the internal construction, arrangement and size of fire pot, grate, flues, oven or heat chambers, dampers, ash pit, &c. The demands of the trade, as gathered through salesmen or direct from consumers, may govern many of these points, or they may have been settled by practical tests instituted for the purpose. Every point in this direction having been covered, the designer comes forward to prepare the shell or overcoat. He makes a flat drawing of about one quarter size, in which the shape, proportions and ornamental features are set forth in sufficient detail to enable his ideas to be clearly grasped. The design is then subjected to severe criticism by experts, and it may be found that a most striking design which would make a very effective piece of stove architecture is impracticable on account of excessive difficulty in reproducing it in cast iron. The design having been approved as drawn or modified, it is then enlarged to the full size of the stove and further criticised. This will probably bring about numerous changes. The next step is to prepare a full-sized clay model. For this purpose a shallow wooden trough is made of the proper width and length for the side of a stove and having the sides beveled to the exact miter. In this trough a perfect reproduction of the accepted drawing is made in clay, requiring great skill and artistic taste. Tops and bases are handled in the same way.

From the clay models plaster casts are made which, when completed and their surfaces blackened, are set up in the semblance of a finished stove. More criticism follows and perhaps much of the work is condemned and must be tried again. Thus the design goes forward slowly. The more elaborate parts are now transferred to wood. Wooden blocks of suitable size are carved into an exact representation of the design. According to old methods these blocks



View in the Molding Shop.—Ramming Sand in Flasks.

would be hollowed out on the reverse side to the proper thickness for patterns and be used as such—a very expensive as well as unreliable process. By the improved method of The Michigan Stove Company a wax impression is taken from the carved surface and it is used in the preparation of a special metal pattern, composed of lead and tin, cast with the usual allowance for shrinkage in the subsequent stove castings. A.

durable pattern is thus secured which will admit of any kind of rough handling and will not warp when stored away. These special metal patterns are used for the most ornamental or intricate parts of stoves. Wood patterns are made for the plainer parts, as they can thus be more easily and less expensively produced or duplicated. Iron patterns are copies of the special metal and wood patterns. They are finished in the iron pattern shop after they have been cast from the originals. To expedite work in the foundry it often becomes necessary to have a considerable number of patterns of some one part. The equipment of a metal pattern shop consists mainly of vises and files. Surfaces are here made as smooth as glass and abutting edges are fitted together precisely. A small brass foundry is often a necessary adjunct, as holes in the iron patterns are closed with brass, defective edges are filled and straightened and additional pieces are sometimes brazed in place. The pattern department of a large stove works is one of the most expensive in the whole establishment, as will be inferred from the foregoing statements. The pattern expenditure of The Michigan Stove Company for 1892 was very nearly $50,000.

The work of preparation being thus set forth, the patterns will be followed to the foundry. Here, under one roof, all the molding is done. The following description of stove molding is from the pen of Superintendent Keep:

Stove castings are made in two-part flasks, consisting of cope and nowel, hinged at the rear. The pattern is so made that the cope can be rolled off, without loosening with wedges if possible, and give a clean lift (no rats), and bars with nails driven in them are so located as to anchor every hanging core. No separate cores, green or dry, are used in stove work, and the size of the flask leaves only 1 inch of sand outside the edge of the pattern. Stove patterns are of iron filed as smooth as possible, and waxed to prevent rusting. They are boarded face up, that is, fitted to a wooden follow board to give the under side a bearing to prevent breakage, or springing by ramming.

The follow board has wooden cleats on the back, which are bedded in sand on the molding floor, that it may lie perfectly solid. All dust and moisture are brushed from the pattern, as the slightest rust will make a rough surface on the casting. The nowel, which has no bars, is placed on the follow board and sand is riddled through a No. 12 sieve, to lie ¼ inch deep on the pattern. Then sand from the heap is shoveled to fill the flask. This is rammed and leveled off with a straight edge. Sand is thrown over this and a bottom board is rubbed down to give a true bearing surface. This bottom board has holes in it to allow gas to escape.

Iron clamps are placed on each side and the box is rolled over, allowing the cleats of the bottom board to rest on a sand leveled floor.

The follow board is then lifted off, leaving the pattern buried in the sand. If the parting line is not firm, the molder presses sand with thumb or trowel until the edge of the pattern makes a perfect parting with the sand. Parting sand, which is burned molding sand, is thrown over the whole surface, and what has fallen on the pattern and any superfluous quantity is blown off with a bellows.

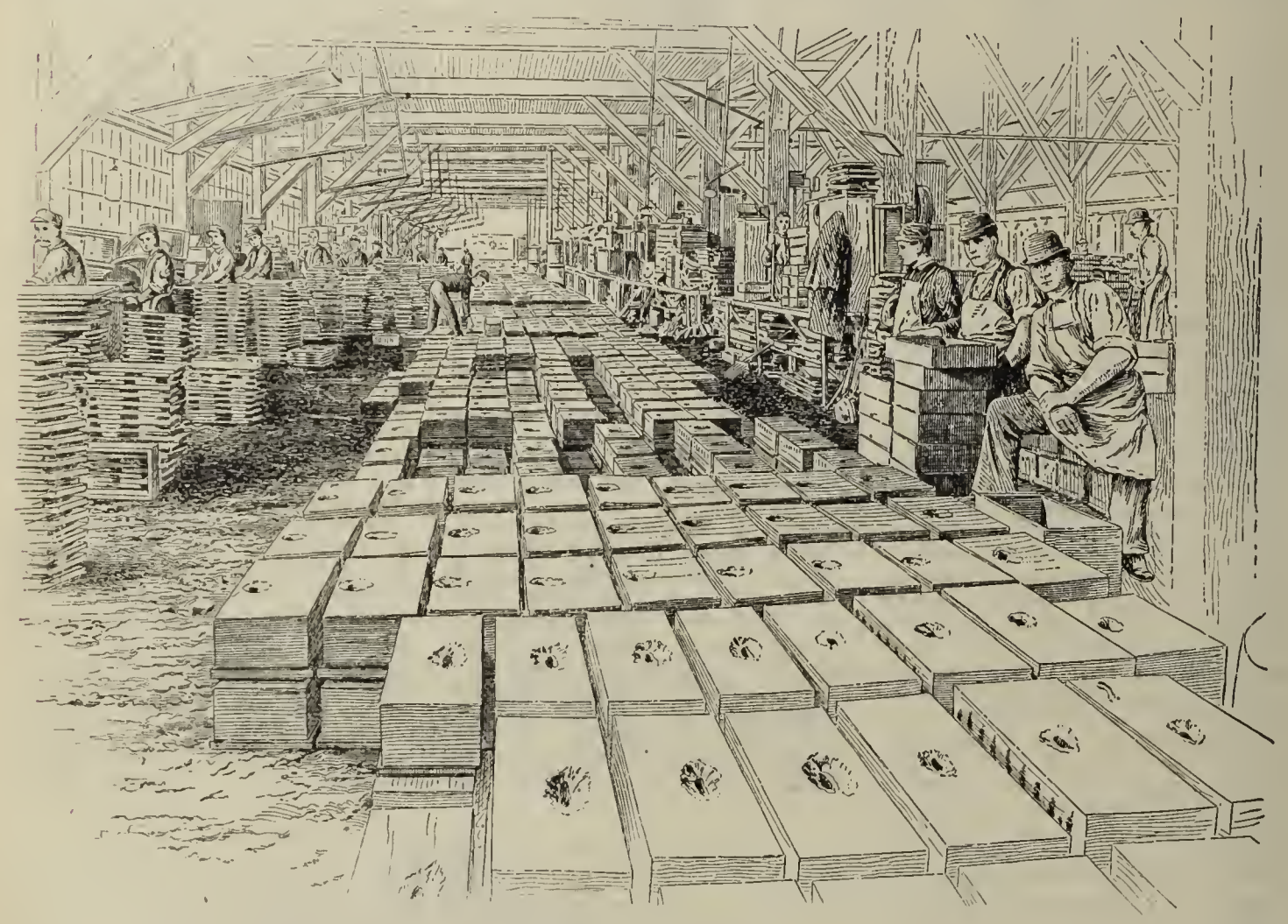
The parting is made by the close fitting of the follow board to the pattern, and any crooked corners are built up with pieces of old leather belting. If the casting is to be run from the edge, iron set gates are placed against the edge of the pattern on the follow board and molded in the nowel.

The parting sand having been blown off, the cope is placed on the nowel and clamped in place, and sprues are placed in position. Flat sprues are set on the pattern, bottom side up. Sand is now shoveled in, and with the hands is tucked under the bars and around the sprues, the flat ones being turned over. The cope is then filled with sand and rammed, the superfluous sand being brushed off. The cope is then rolled off, and rests on its hinges and on a box placed in the rear. The sprues are drawn out, and the inner opening is trimmed with a slick to prevent loose sand breaking off with the inflowing iron. The pattern is now withdrawn, and if there are any imperfections in the mold they are repaired. Heavy facing is shaken over the mold, and when the cloud has settled, light facing is shaken over this, both from muslin bags. The pattern is now printed back, the set gates are withdrawn, and the pattern is removed.

The heavy facing is to prevent the iron burning the sand and to give a smooth surface and a good color. The light facing is simply to prevent the pattern from sticking to the heavy facing. If any heavy facing should stick, it would leave a rough spot—if too much light facing is used it will wash and run before the iron and will make a worse surface than sticky heavy facing.

The mold is now closed and clamped exactly as it was when rammed up.

The snap floor extends almost the full length of one side of the foundry. It is intended for molding small pieces. For this purpose snap flasks are used. These flasks are made with hinged sides, fastened by a hook or snap. After the sand has been rammed in place and the pattern removed, the flask is unfastened, taken off and used with another pattern. The sand retains its position for a small casting without the support of the flask. In this way comparatively a few snap flasks form an equipment for a large floor, avoiding the investment of capital in numerous flasks. Large pieces, however, must be molded in stationary flasks, as previously described. These are laid out in floors from 7 to 9 feet wide and about 28 feet long, holding two or three rows of flasks, with one molder to each floor.



East Snap Flask Shop.

The process of casting is very interesting. Two cupolas are in use, located some distance from each other, so as to be convenient to all parts of the molding shop. One is 6 feet 8 inches in outside diameter and the other 6 feet. In these alternate layers of coke and pig iron have been dumped from an elevated platform. After they have been fired, the heat is intensified by a blast of air from a blower in the engine room, connected with the cupolas by under-

ground pipes. This operation is so timed that the molten iron will be ready for pouring when the molders have completed their work of preparing the molds. The cupolas are supported on posts of a proper hight for drawing the metal from the bottom into hand ladles. Everything being in readiness, the molders gather in regular lines with their long handled ladles to receive the liquid iron. The blast is



Ready for Casting.—No. 1 Cupola.

checked, the tap hole is opened and the fiery stream flows down a short spout to be caught by one ladle after another and carried to the different molds. Here a helper with a suitable implement skims the slag or oxidized metal from the top of the ladle, so that only the pure stream of iron flows into the pouring hole in the mold. If the castings are small, the molder flits rapidly from one to another mold, leaving but part of the contents of his ladle in each. If the castings are large, several molders may at the same time pour from their ladles into the one mold. When the ladles are empty they hasten back to have them refilled until the molds have all been properly attended to. It might be supposed that some better plan could be adopted than that of carrying the ladles by hand to all parts of the foundry. Labor-saving devices have been tried in stove foundries, but have been abandoned as less satisfactory than the hand ladles. An enormous amount of metal is carried in this way. The two cupolas referred to melt an average of 67 tons per day, their output having run up as high as 71 tons 13 hundredweight. The men all work here by the piece, every effort being made to help them to earn as much as they can, because in this way will the company also make the most money.

Mr. Keep uses in this foundry his well-known test of cast iron, by which uniformity in results is secured. An iron follow board is used, with gated patterns of a square and flat bar. On this board are placed a pair of yokes, with parallel chilling surfaces 12½ inches apart. The ends of the bars run against these surfaces when poured. The yokes and bars are then taken out of the sand, carefully cleaned and placed on a measuring table, which is a counterpart of the follow board, with openings through it at both ends of each bar. The bars and yokes are placed on it exactly as they were in the mold. The shrinkage of the bars from the yokes is then measured with a graduated steel wedge or gauge measuring $\frac{1}{1000}$ inch. This will show whether the shrinkage is too great or too little, and whether the iron used contains too little or too much silicon, when the proper remedy can be applied by changing the mixture of iron at the cupola. The same bars are used for making tests of transverse strength and for ascertaining the depth of chill. These tests are carefully and very regularly made, so that the utmost precautions can be taken to insure sound, strong and perfectly fitting castings. Small quantities of aluminum are also used in the cupola mixture, as that remarkable metal, it is said, imparts beneficial properties to iron, making it pour more smoothly, preventing blow holes and making castings less liable to break.

From the foundry the castings go to the scratch room, where the large pieces are cleaned by hand with steel wire brushes and the smaller pieces are cleaned in tumbling barrels from which the dust is exhausted by a large fan. The tumbling barrels are large horizontal cylinders strongly made of cast iron. A portion of the shell is removable, for the purpose of putting castings in and taking them out. On account of the great weight of barrels and contents they are operated by cogged gearing. The cleaning room is located so as to be easily reached from all parts of the foundry. From this point two routes are taken by the different classes of castings. By one route the plainer portions pass to the mounting shop, while by the other route the pieces to be ornamented, japanned or nickeled pass forward until they meet the finished stove in the inspecting room. A system of shelving has been constructed as an adjunct to the scratch room, with a separate rack for each kind of casting large enough to hold the number of pieces made in four days. In the mounting shop a sufficient space is allotted to each man to assemble the parts of a stove, which are brought from the shelves in truck loads. He has graded emery wheels, driven by power, for grinding edges, at which either he or an assistant finishes the castings so as to make them fit nicely in their places. All doors and close joints are fitted with files. The castings which are taken by the other route go to the grinding and polishing room, in which there are emery wheels of many sizes and shapes. Some of these wheels have convex surfaces to work in indentations, while others have concave surfaces to work on curved castings. These wheels are made on the premises, so many being used that a special department was formed for the purpose. Circular wooden blocks constitute the centers. A heavy coat of strong glue is applied to them, after which they are covered with ground emery of varying degrees of fineness, according to the work to be done. Polishing follows the grinding. This is accomplished with very fine emery wheels and bull-neck wheels made of heavy leather. No belts are here used for polishing, as it has been found that better results are obtained with wheels. Parts to be japanned are taken to the japanning department, which contains a complete equipment for applying the durable glossy coat. They then go to the gilding, ornamenting and striping department. The parts to be nickeled receive much more elaborate treatment. They are placed in tanks and scrubbed with potash and hot water, then with pumice stone, after which they are washed in hot water and lastly with cold water, when they are ready for the nickel bath.



In the Polishing Room.

The nickel plating department of this establishment is on an unusually large scale to meet the requirements of the company's business. Special dynamos furnish the electrical current necessary, and about 6000 gallons of solution are in constant use.

After remaining in the nickeling tanks a sufficient time the castings are taken out and dried, when they pass to the buffing room, in which the wheels used are made of Spanish felt. This imparts the very high polish that is a conspicuous feature of nickeled work. From the buffing room, after the pieces are carefully inspected, the next step is to the nickel packing room and from there to the general inspecting room, where decorated parts meet the completed stoves from the mounting shops. Crating with wood next follows, after which the stoves are either shipped or stored in the warehouses to await the demands of the trade.

A peculiar feature of the stove business, in which it is unlike almost any other manufacturing industry, is the practice of furnishing repairs or new pieces for any part of a stove. As there are from 75 to 300 separate pieces in every high-class stove, and such stoves are made in a variety of styles and in a number of sizes, requiring an immense number of special castings, it will be seen that the furnishing of repairs is a most intricate matter, requiring elaborate arrangements in order to conduct it satisfactorily and economically. The Michigan Stove Company's system is very complete. In the basement of their main building, and overflowing into an extension which was found necessary, are an enormous number of racks, laid off in aisles, built up to the ceiling, and all numbered and indexed, in each of which are stored parts of stoves. This part of the establishment is appropriately christened "the catacombs," as it is a perfect labyrinth of passages in which it would be an easy matter for a visitor to lose himself. The racks are constructed so as to hold a certain number of pieces, and whenever one becomes nearly empty orders are sent to the foundry for more castings of the same pattern. From this stock any part needed to repair any stove made by the company from the beginning of the business can be furnished instantly, or all the parts essential to the construction of a stove of a particular pattern can be easily assembled.



In the Grinding Room.

Manganese Ore in Russia and Greece.

In a late report to his government the British Vice-Consul at Poti, in the Caucasus, makes the following statement in regard to the production of manganese ore in that district: "The Caucasian manganese appears able to compete with that of any other part of the world, and is largely shipped, not only to England and the Continent, but also to the United States. Last season did not, however, prove a profitable one to those engaged in the trade, partly on account of the drop in prices owing to the anticipated opening of the railway to the mines, partly because of bad trade in England and America. The new narrow gauge railway from Chiatur to Sharopan was opened during the autumn, but frequent landslips and the want of sufficient rolling stock have hampered its operations, and it does not appear probable that for some time it will be able to bring down nearly all that is mined. Ultimately the effect will be to divert the trade entirely from Kvirili, its present headquarters, to Sharopan and Chiatur, the termini of the branch line." Another agent of the British Government, James Boyle, in a report on the trade of the Laurium district of Greece, shows that the production of manganese ore in that district amounted in 1893 to 178,098 tons. In connection with the subject, Mr. Boyle makes the following observations: "It may interest buyers in the West of England to know that new discoveries of large lodes of manganese iron ore are rendering it very abundant. Attention should also be called to the fact that the best of these ores is often slightly impregnated with arsenic."

Cast Iron vs. Forged Soft Steel Brake Shoes.

Charles T. Schoen has written to the *Railroad Gazette* a letter on the relative merits of cast iron and forged soft steel for brake shoes. He says:

The question as to what metal is best adapted for use for brake shoes is of vastly more importance than one would suppose, if only a passing thought be given it. The main points to be considered in deciding the question are: First, economy in wear, considering the first cost of each; second. relative wear of wheels; third, the coefficient of friction or retarding power.

It has been demonstrated by tests in service that one brake shoe made of forged, soft, low carbon steel will outwear about seven cast iron shoes; or, in other words, the wear is 1 pound of soft steel shoe to 8 pounds of the cast iron shoe for the same service. This answers the first question to be considered in favor of the soft steel shoe, because the cost of it per pound is but three times that of cast iron, while the demonstrated practical value is eight times.

The second proposition is the relative wear of wheels, and there has been room for doubt whether the soft steel would not wear the wheel faster than cast iron; this doubt comes from the fact that friction has generally been connected with wear, the assumption being that the greater the wear the greater the friction, but this is now known to be dependent upon the nature of the material. The results, from a long period of tests, show that soft steel does not wear steel tires or chilled wheels any more than, and not as much as, cast iron shoes. The reasons for this are obvious: The steel shoes to wear the wheel faster than cast iron would have to be harder, but the fact is they are softer, having only 0.10 carbon. The question naturally arises, If the steel is softer, how is it that it only wears one-eighth as fast as cast iron? The answer is simple, and embodies the secret of the economy of the soft steel shoe. Soft Bessemer steel is homogeneous, and the molecules, although soft, hang tenaciously together and resist separation, so that they are not readily pulled apart by the friction, thus reducing the wear. Cast iron, on the contrary, is not homogeneous, and the molecules are not held together with anything like the force that exists between the molecules of soft steel, and the particles separate easily and fly off, just as the particles fly off from emery wheels. In other words, the real cause of the excessive wear of cast iron shoes is the waste occasioned by the separation of the particles from each other, and the falling off without having performed any really useful function in braking.

The third question about the coefficient of friction, or retarding power, is one that is still unsettled. The reports of tests show that the retarding power of the soft steel is as great as, if not greater than, that of cast iron. Yet we can easily see how the retarding power would not be as great with hard steel shoes as with cast iron, but on this point it is well to wait for the data from the M. C. B. Committee on Laboratory Tests before going too far in reaching a decision as to the coefficient of friction.

Besides other incidental advantages of a long wearing soft steel shoe, there is the all important one of the less number of times the shoe has to be changed, and the decreased inspection required to keep up the slack.

THE RAPID STOVE & FURNACE COMPANY of Baltimore, Md., call attention in their advertisement this week to the Rapid Transit Air Circulating and Ventilating Stove and Double Heater. This is said to be simple in construction, uniform in heating and moderate in coal consumption. The company request those interested to write for a copy of their catalogue.

TRADE REPORT.

Metal Market.

Pig Tin.—Excessive supplies and a spiritless consumptive demand have induced a weakness in the market for Pig Tin. Sales of comparatively large lots have been made as low as 19.57½¢ for July delivery and 19.65¢ for the balance of the year. Jobbers' prices for small lots of Straits Pig rule from 20½¢ to 21¢ ℔ lb.

Copper.—Business during the week has been so narrow that the present true market value of Copper is extremely difficult to arrive at. The consumption, according to most accounts, both in this country and in Europe, is fairly liberal and has been somewhat stimulated by the unusually low prices that have prevailed of late. Yet orders from small consumers appear to be no larger in volume, and jobbers' prices remain unchanged at former quotations.

Sheet Copper.—The demand has eased off somewhat as compared with last week, leaving much to be desired by manufacturers of Sheet Copper. Prices for Manufactured Copper remain at their former level.

Pig Lead.—A fairly large business has been transacted during the week, and prices show more firmness. It is stated that washouts at producing points have checked the output more or less, that smelters are well sold up and that speculative holdings have been reduced to comparatively small proportions. Jobbers ask from 3⅝¢ to 3⅞¢ ℔ lb for American Pig.

Lead Pipe and Sheet.—The market is very flat and consumers continue indifferent. The manufacturers have issued a revised price-list for Pipe and Sheet Lead, to which reference is made in another column. The reduction amounts to ¼¢ ℔ lb on Pipe and ¼¢ on Sheet, with the usual 20 % discount.

Spelter.—No change has taken place except perhaps that the better tone which devcloped last week has made some headway. That is to say, the offering is more reserved and it is more difficult to buy at prices that were commonly quoted early in the month. The common price asked for small retail lots of Western is 4¼¢ ℔ lb.

Antimony.—The market has been quiet and prices have shown very little change. Jobbers' prices for small lots is about 10¾¢ for Cookson's and 9¾¢ for Hallett's.

Nickel.—The popular quotations are 45¢ @ 50¢ for fair sized lots.

Tin Plates.—There has been little change in the Tin Plate market, or in the character of the demand, which is still confined largely to purchases of moderate quantities for immediate consumption. Some fair spot orders have been placed, and a few transactions in futures are noted. The market, as a whole, has, however, been irregular, reflecting the condition of uncertainty in which consumers are now existing. A number of large users of Tin Plates are supposed to be holding off their orders until the last possible moment, in view of the probable imposition of tariff changes. The domestic manufacturers are almost all as busy as they can be, with orders enough to keep their works running for some time to come. Prices keep remarkably level, though they are still low. A special cable dispatch to *The Iron Age*, dated London, June 20, reports that Tin Plate prices in the British market have further hardened, but the demand is not equal to expectations. Forward business is restricted, as sellers expect a good advance shortly. Fair sales have been made of 14 x 20 Bessemer Cokes at 10/3 and Siemens at 10/6, f.o.b. Swansea. Present quotations at that point are as follows:

Bessemer Cokes, 14 x 20	@ 10/3
Siemens Cokes, 14 x 20	@ 10/6
Ternes, double box	@ 19/
Charcoals	13/ @ 15/

Sheet Iron.—A good business has been done in Black Sheets for roofing purposes, and the demand from Tin Plate manufacturers increases weekly. Mills are hastening to place Tin rolls to meet the growing requirements of this industry. Prices are firmly held. A good inquiry is reported for Galvanized Sheets, but manufacturers are not disposed to quote for extended deliveries. The discount quoted for small lots from store is 75 @ 75 and 5 %.

Chicago Report.

Scrap.—Dealers continue to quote the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto and Ch
Chicago, Ill	$5.25	$5.50
Milwaukee, Wis	5.25	5.50
Kansas City, Mo	8.45	8.70
Council Bluffs, Iowa	8.45	8.70
Lincoln, Neb	8.60	8.85
Sioux City, Iowa	8.45	8.70
Aberdeen, S. Dak	8.50	8.75
Dubuque, Iowa	6.55	6.80
Madison, Wis	6.75	7.00
St. Paul, Minn	7.75	8.00
Burlington, Iowa	6.75	7 00
Des Moines, Iowa	8.20	8.45
Davenport, Iowa	6.55	6.80
St. Joseph, Mo	8.45	8.70
Leavenworth, Kan	8.45	8.70
Omaha, Neb	8.45	8.70

TARBOX MFG. COMPANY, New London, Conn., proprietors of the well-known Tarbox Stove Gloss, are putting on the market in 10-cent bottles what they describe as "The Nineteenth Century Stove Polish" and sell under brand 13½. It is a water blacking for hot or cold stoves, which is always ready and easily applied. One bottle, it is claimed, will make four when diluted. Circulars will be sent to the stove trade on application.

CONDITION OF THE

Hardware Trade.

TRADE CONTINUES in moderate and diminishing volume, as is expected at this season. Some of the larger houses are covering their requirements for early fall trade, but orders are placed conservatively and not for as large quantities as usual, the policy of keeping near the shore being still quite generally followed. There is a fair though not heavy business from the smaller trade, with many of whom the demand is much more limited than usual, and they are accordingly keeping their stocks down to as low a point as possible. The declines which have occurred in prices during the past year induce a closer adherence to this policy than would be the case if the market had not for a long time been a declining one. Whether the bottom has yet been reached is a question which careful men are canvassing. It is the opinion of many manufacturers that prices in many lines are not at all likely to go lower, and when the reaction comes from the sluggishness of trade, it is considered probable that there will be a strengthening in values, in some lines at least, and a scarcity of some goods is not improbable. It is hoped that the tariff question, the delay in the settlement of which is having so mischievous an influence on business, will be disposed of before long, so that there may be at least an opportunity for a good fall trade.

Advices from Chicago.—Extremely hot weather prevailed all over the West last week, causing an unusually heavy demand for Refrigerators, Window Screens, Screen Doors and other summer goods. The large number of rush orders thus received indicated very forcibly the conservatism with which retail merchants had purchased stocks of such goods in advance of the season. Ordinarily, the demand would have been light for some time after the advent of hot weather, or until first stocks had been run off. Now, however, the demand is thrown at once on the jobbers, which shows that they have been made to carry the stocks. Hand to mouth buying keeps down stocks in retailers' hands below their normal size, and there is no allowance for even a slight increase in local consumption. Other lines of goods in Shelf Hardware are moving in about the same volume as heretofore, orders being small for sorting up, yet fairly numerous. Sales in the aggregate are running about even with last month. Sheet Iron is beginning to move from jobbers' hands at last. They are receiving plenty of inquiries for prices for immediate delivery and are quoting prices for small lots, which are about what manufacturers charged last year. The stove trade is picking up to some extent. Orders are now being booked for fall delivery, and among them are not a few for good sized stocks. Very dry weather has prevailed through the West for the past three or four weeks, causing a great deal of apprehension for the crops now growing, but on Friday and Saturday local rains broke the drouth and prospects have greatly improved.

Notes on Prices.

Wire Nails.—There is a perceptible falling off in the volume of business and most of the mills are well up with their orders. Some of them, in view of the summer dullness, are curtailing their production and preparing to close altogether for a few weeks. The price of $1.10 for carload lots at mill is well

maintained. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Manufacturers report trade very quiet. Even inquiries are light. The factories are reducing their output, either getting down to single turn or stopping entirely. Prices are very firm at $1.20 to $1.25, Chicago delivery. The local situation is now much better, as prices have been relieved of their irregularity. Jobbers' large stocks have been worked off, and a uniform rate of $1.25 is quoted on small lots from stock. While the demand from retailers is not heavy, as they are buying merely what they absolutely need, no objections are raised to the payment of this price.

Cut Nails.—The price remains the same as given in our last report, the market being represented by the quotation of 95 cents to $1 for carload lots of Nails delivered on dock in New York. Small lots from store in New York command $1.10 to $1.15. The demand is only moderate. The Western manufacturers are not competing so vigorously for Eastern trade as a short time ago. A number of the mills are preparing to shut down.

Advices from Chicago.—Local manufacturers are in receipt of a good run of orders, which have accumulated to such an extent that they are anxious to resume operations, but are still unable to do so for lack of coal. Prices are unchanged at 90 to 95 cents for 55-cent average. Jobbers quote $1.10 to $1.15 for small lots from stock.

Barb Wire.—The Barb Wire market is quiet and the mills generally have pretty well cleared up their order books. Prices are well maintained on the following basis for Four-Point Galvanized, delivered: Pittsburgh, $2.10; Cleveland, $2.15; Cincinnati or Allentown, $2.30; Chicago or New York, $2.35.

Advices from Chicago. — Dullness now pervades the trade in Fence Wire, but there appears to be no weakness in prices. The last advance made is maintained. Jobbers report a very light movement from stock and continue to quote Galvsnized at $2.35 to $2.40 for small lots and $2.20 to $2.25 for carloads.

Sheet Lead, Lead Pipe, &c. —A reduction has been made by the manufacturers of these goods under date June 20, the following revised prices being announced, which are subject to the usual discount of 20 per cent.:

	Cents per lb.
Lead Pipe	5¼
Block Tin Pipe	35
Sheet Lead	6¼
Tin Lined Pipe	15

Cordage.—There is only a moderate demand for Rope, but prices are steadily maintained. The market is largely in the hands of jobbers as the result of the repeated advances, which gives them an opportunity to sell at factory prices. Large lots, f.o.b. factory or New York, are selling at the following quotations, which are subject only to a discount of 1½ per cent. for cash:

	Cents.
Manila, base	7
Sisal, "	5
New Zealand, base	5

Great American Fish Scaler.—Covert's Saddlery Works, Farmer, N. Y., who are putting this article on the market, are selling it to the trade at $1 per dozen net. The Scaler was described in our last issue.

Glass.—The market on American Glass continues to stiffen as the date for the annual closing down of factories approaches. Some factories have been obliged to close on account of lack of fuel, while others have closed because of the hot weather. One of the largest factories in the Pittsburgh district will close next week, a week ahead of the regular date for closing. The demand is reported fair in small quantities, and orders as being numerous. It is understood that Pittsburgh manufacturers are not inclined to accept new orders at 85 per cent. discount, while the New York market is represented by quotations of 80 and 20 per cent. discount for single or double strength Glass in any quantity. Reports indicate that Plate Glass factories are well supplied with orders, and that prices show firmness at quotations of 70 to 70 and 10 per cent. discount, with an advancing tendency.

Trade Notes.

THE CRAIGHEAD MFG. COMPANY are a new concern who have been incorporated to manufacture Lamps and other brass goods at Shelton, Conn. The head of the firm is Horace E. Craighead, late of the Craighead & Kintz Mfg. Company of Ballardville, Mass. The company have taken possession of the Erschell factory, at Shelton, which will be adapted to the new business.

THE ZUCKER, LEVETT & LOEB COMPANY of New York City have been incorporated with a capital of $100,000 to manufacture Polishing Materials, Platers' Supplies and Electrical Apparatus.

THE LAUFMAN TIN PLATE COMPANY of Pittsburgh, Pa., state that they are rolling their plate of best decarbonized steel and guarantee all sheets to double seam. They are at present offering the trade the following brands: Laufman's Apollo, Tip Top, Freeport and Allegheny. Descriptive circulars and prices will be mailed by the company to applicants.

THIS BEING convention week, it is natural to suppose that every one is interested in steam boilers and everything pertaining thereto. On this assumption our patrons will find entertaining reading in the announcement, presented elsewhere in this issue, of William Vanderman of Willimantic, Conn. The pages which he occupies are devoted to the presentation of the line of steam and hot water boilers and hot water damper regulator which he offers for sale. The illustrations represent general and sectional views of the Samson Boilers, the Vanderman Steam or Hot Water Heaters, the Vanderman Triple Flue Boilers and the Vanderman Hot Water Damper Regulator. Mr. Vanderman is well known throughout the trade as a practical heating and sanitary engineer with an experience of 27 years, during 16 of which he has carried on the heating and ventilating business.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, illustrate several kinds of Register Boxes in their advertisement this week. A complete price list of such boxes was published in their last week's advertisement.

THE INSTANTANEOUS WATER HEATING COMPANY, with Eastern office at 838 Broadway, New York, call attention in their advertisement this week to the goods which they manufacture, and state that every heater is guaranteed as represented. They also state that the trade in New York City and vicinity will find it to their advantage to send customers to inspect the line of Instantaneous Water Heaters which they have on exhibition.

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Metal and Miscellaneous Prices.

CHICAGO, JUNE 21, 1894.

Tin—

raits pigs.....21¼¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special rices, according to quality.

		Per box.
	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
aliand and	IX, 10 x 14	@ 8.75
elynGrade	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
llaway Grade,	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
eel Coke—IC, 10x14.14x20	@$5.60
IC, 14x20.90 ℔	@ 5.35
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
.V. Grade. IC, 10x14, 14x20	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special rices, according to quality.

lansel and Dean Grades.—	
IC. 14 x 20	@ $5.50
20 x 28	@ 11.00
IX. 20 x 28	@ 14.00
Vorcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
X, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
X, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
X, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
X, 14 x 60	35.50	20.90

American Tin Plates.

Charcoal Plates.—Bright.

lorence.—	
IC, 10 x 14, 12 x 12, 14 x 20	$6.75
IX, 10 x 14, 12 x 12, 14 x 20	8.50
alma.—	
IC, 10 x 14, 12 x 12, 14 x 20	$7.00
IX, 10 x 14, 12 x 12, 14 x 20	9.00

Each extra cross $2.00 and 20 x 28 onble these prices.

rilliant, Tissne Packed, IC, 14 x 20	$9.25
oyal ,extra. IC, 14 x 20	7.25
lerion, IC, 14 x 20	7.00
lmond, IC, 14 x 20	6.50
lint, IC, 14 x 20	6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20	$6.00
IC, 20 x 28	12.50

Roofing Plates.

Palm, IC, 20 x 28	@$11.50
Palm, IX, 20 x 28	@ 14.00
Empire, IC, 20 x 28	@12.00
Empire, IX, 20 x 28	@15.00
Hickory, IC, 20 x 28	@ 12.50
" IX, 20 x 28	@ 15.50
Alaska (heavily coated), IC, 20x28	@$14.50
Alaska IX, 20 x 28	@ 17.75
Special, IC, 20 x 28	@ 14.75
" IX, 20 x 28	@ 17.25
Westmoreland:	
IC, 14 x 20	$6.00
IC, 20 x 28	12.00
Elwood:	
IC, 20 x 28	$11.50
Kenwood:	
IC, 20 x 28	$11.50
Furmston:	
IC, 20 x 28	$11.00
Juno:	
IC, 14 x 20	$5.75
IC, 20 x 28	11.50
Illinois, Old Method:	
IC, 20 x 28	$17.00
E. L.:	
IC, 20 x 28	$12.50
Jessie:	
IC, 20 x 28	$12.00
Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20	$9.50
Scott's Extra Coated, Stamped and Resqnared, IX, 14 x 20	11.00
Scott's Extra Coated, Stamped and Resqnared, IC, 20 x 28	19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28	22.00
Neville, Stamped, IC, 14 x 20	6.25
" " IX, 14 x 20	7.50
" " IC, 20 x 28	12.50
" " IX, 20 x 28	15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared)	$9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resqnared)	19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resqnared)	8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared)	16.50
Columbia, IC, 14 x 20 (Stamped)	7.25
" IC, 20 x 28 (Stamped)	14.50
Maple, IC, 14 x 20 (Stamped)	6.75
" IC, 20 x 28 (Stamped)	13.50
Willow, IC, 14 x 20	6.50
" IC, 20 x 28	13.00
Knoxall, IC, 14 x 20	6.25
" IC, 20 x 28	12.50
Globe, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
Miami, IC, 14 x 20	6.00
" IC, 20 x 28	12.00
" IX, 20 x 28	15.00
" (Redipped), IC, 20 x 28	17.00
Old Process:	
IC, 14 x 20	9.25
IX, 14 x 20	11.25
IC, 20 x 28	18.50
IX, 20 x 28	22.50
H. B. L., Old Style:	
IC, 14 x 20	7.75
IX, 14 x 20	9 25
IC, 20 x 28	15.50
IX, 20 x 28	18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	₩ ℔ 2 3-10¢	3 1-10¢
17 to 20	₩ ℔ 2 4-10¢	3 2-10¢
21 to 24	₩ ℔ 2 5-10¢	3 3-10¢
25 and 26	₩ ℔ 2 6-10¢	3 4-10¢
27	₩ ℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers	13¢ net.
Patent Planished	₩ ℔ A, 10¼¢; B, 9¼¢ dis. 5%
Craig's Polished Sheet Steel	8½¢

Galvanized.

Juniata or first quality	dis. 75@5%

Copper—

Ingot.

Lake	10¼¢ @ 10¾¢
Casting Brands	9¾¢ @ 10¼¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Disconnt on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gliding Tube, 3¢ ₩ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.)
(To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch	$0.35
Plain, 5/8 inch up to ¾ inch	.33
Plain, ½ inch up to 5/8 inch	.38
Plain, 3/8 inch up to ½ inch	.41
Plain, 5-16 inch up to 3/8 inch	.48
Plain, ¼ inch up to 5-16 inch	.65
Plain, 3-16 inch up to ¼ inch	1.00
Plain, ⅛ inch up to 3-16 inch	1.50
Plain, 2 inch up to 3 inch	.33
Plain, 3 inch and larger	Special.
Plain, smaller than ⅛ inch	Special.
Bronze and Copper	3¢ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter	4¢

Sheet Zinc—

600 ℔ casks	4⅝¢
300 ℔ casks	4¾¢
Loose sheets	5⅛¢

Lead—

Soft Pig Lead	4 ¢
Bar	4½¢
Pipe	5½¢, dis. 10¢
Block Tin Pipe	35¢
Sheet	6¢, dis. 10%

Solder—

½&¼	13¢
Extra Wiping	11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson	12½¢
Hallett's	11½¢

Wrought-Iron Pipe—

1¼ and under, Plain	57½%
1¼ and under, Galv	50%
1⅛ and over, Plain	67½%
1⅛ and over, Galv	57½%
Boiler Tnbes, list Oct. 24, 1892	70&10%
Casing, list Nov. 16, 1892	52½%
Inserted Joints Casing, list Nov. 16, 1892	47½%
Steel Boiler Tubes	27½%
Cold Drawn Seamless Steel Tubing	50%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive	dis 70&10%
Other sizes	dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted	55¢
Austin's Corrugated	60%
Gordon & Gilbert's Corrugated	60%
Ritchie's (Galv. Iron only) Cor'd	60%
Ritchie's Spiral Lock Seam, Galv'd	55%
Anstin's Spiral Ribbed Pipe	60%
Plain Adjustable Elbows	60%
James A. Miller Bros. (Galv'd Iron only) Corrugated	60%

Furnace Fittings—

Disconnt from Excelsior Steel Furnace Co.'s list	50%

Steel Roofing—

Perfection	$3.50 square
Climax	$3.35 sqnare
The Lloyd Spanish Tiling	$4.50 square

Metallic Shingles—

Cushman's	$1.50 square
Merchant & Co.'s Spanish Tiles:	
Copper, 14 oz	$36.00 sqnare
Tin	$9.75@$14.25 square
Steel, painted	$9.00 sqnare

Drain Pipe—*Tile.*

Discount from list	70%

Paints, Oils, &c.—

Deodorized Benzine	7½@8 ¢
Iron Paint, Bright Red	₩ ℔, 2 ¢
" " Brown	₩ ℔, 1½¢
" " Purple	₩ ℔, 2½¢
" Ground in oil, B. Red	₩ ℔, 6½¢
" Ground in oil, Red	₩ ℔, 6½¢
" Ground in oil, Brown	₩ ℔, 5½¢
" Ground in oil, Purple	₩ ℔, 6 ¢
Linseed Oil, Boiled, in bbls	54¢@56¢
Liuseed Oil, Raw, in bbls	51¢@53¢
Mineral Paints	2@4¢
Orange Mineral	9¾¢
Pure White Lead in Oil	6@6½¢
Dry White Lead in bbls	5½@5¾¢
Red Lead, American	6@6½¢
Red Venetian, English, dry	$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs	7½¢
Sipe's Japan Oil, in bbls. ₩ gal	54¢
Spirits Turpentine, in bbls., ₩ gal	36¢ @36½¢
Asphaltum, Trinidad Refined, ₩ ton	$40
Tarred Felt, 1 Ply, ₩ 100 ℔	$1.60
Tarred Felt, 2 Ply, ₩ roll 108 sq. feet	$1.25
Tarred Felt, 3 Ply, ₩ roll of 108 sq. feet	$1.70
Roofing Pitch, ℔ bbl. of 300 ℔	$3.00

NEW YORK, JUNE 22, 1894.

The following quotations are for small lots.

Aluminum—

o. 1 Aluminum (guaranteed over 98% pure), in rolling ingots	
mall lots	₩ ℔, 65¢
00-℔ lots	₩ ℔, 63¢
on lots	₩ ℔, 60¢
o. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting:	
mall lots	₩ ℔, 63¢
00-℔ lots	₩ ℔, 60¢
on lots	₩ ℔, 55¢
o. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting:	
mall lots	₩ ℔, 60¢
00-℔ lots	₩ ℔, 55¢
on lots	₩ ℔, 50¢

Antimony—

ookson	₩ ℔, 10¼¢
lallett's	₩ ℔, 9¾¢

Brass—

Planished	net
Roll and Sheet	25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¾-in. up to 2-in	$0.35
5/8-in. up to ¾-in	.36
½-in. up to 5/8-in	.38
3/8-in. up to ½-in	.41
5-16-in. up to ¾ in	.48
¼-in. up to 5-16-in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 15, inclusive,	.38

25 @ 30%

Copper and Bronze Tubing—

8¢ ₩ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*

Galvanized	60%
Galvanized, Locked Joints	60%
Tin	60%

Spiral Riveted—

Galvanized	50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

Bottoms, Pits and Flats..19¢ ₩ ℔, net

Ingot.

Lake	10½¢
Ansonia Grade Arizona	10 ¢
Ansonia Grade Casting	9½¢
Planished	net
Sheet and Bolt	15¢ ₩ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized	60&10%
Lap or Slip Joint Terne	60%

Eave-Trough Mitres—

Lap or Slip Joint	list, net

Elbows—

Plain Adjustable—

Tin	70%
Galvanized	70%

Crimped Tubing—

Re-Tinned or Galvanized	35%

Stove-Pipe—

Buffalo Four-Piece.

4½	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz.

..80%

Elbows and Shoes—

Flat Crimp.

Tin	35%
Galvanized	35%

Corrugated.

Flat Crimp.

Galvanized	60%

Round or Square.

Tin	60%
Galvanized	60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	₩ ℔, 2.50	2.80¢
Nos. 17 to 21	₩ ℔. 2.60	2.90¢
Nos. 22 to 24	₩ ℔, 2.70	3.00¢
Nos. 25 and 26	₩ ℔. 2.80	3.10¢
No. 27	₩ ℔. 2.90	3.20¢
No. 28	₩ ℔, 3.00	3.30¢
American B. B.	₩ ℔, 4¢@4½¢	

Russia, Planished, &c.

Genuine Russia, according to assortment	₩ ℔, 11¾@12½¢
Patent Planished	₩ ℔, A, 10¢: B, 9¢. 5%
Craig Polished Sheet Steel	₩ ℔ 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@76&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig	3⅝¢@3⅞¢
Bar	4½¢
Pipe	5¼¢, 20%
Tin Lined Pipe	15¢. 20%
Block Tin Pipe	35¢. 20%
Sheet	6¼¢, 20%

Old Lead in exchange, 2¾¢ ₩ ℔.

Metal Expanded—

Manufacturers' list No. 5.

Lathing	10%
Fencing, Painted Sheets	20%
Netting, Painted Sheets	20%
Door Mats, Galvanized	25%
Window Guards, Paneled	15%
Tree Gnards, Paneled	15%

Mitres Eave-Trough—See *Eave-Trough Mitres.*

Paints Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7⅛
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6½ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil:	
Raw, ₩ gal	.. @ .50
Boiled	.. @ .53
Spirits Turpentine:	
In bbls	.. @ .30½
Putty:	
In barrels and ½ bbls	.01⅝ @ .01¾
In tubs	.01⅝ @ .01¾
In tin cans	.01¾ @ .02¼
In bladders	.01¾ @ .02¼
Roofing Material, &c.:	
Asphaltum, Trinidad Refined, ₩ ton	$30.00@$35.00
Asphaltum, Rock, ₩ ton	$14.00
Coal Tar Felt, 1 Ply, ₩ ℔	2¢
Coal Tar Felt, 2 Ply, ₩ roll 108 sq. ft.	$1.42½
Coal Tar Felt, 3 Ply, ₩ roll 108 sq. ft.	$1.85
Roofing Pitch, ₩ bbl	$2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches...65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe, " " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₱ ℔	₱ cub. foot.
Slag Wool, ordinary	1¼	15¢
Slag Wool, extra	4½	38½¢
Rock Wool, ordinary	2¼	27¢
Rock Wool, extra	7½	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₱ bbl. $1.42@$1.43
Rosin, E. & F.....₱ bbl. $1.50@$1.75
Rosin, G. & H.....₱ bbl. $1.90@$2.15
Rosin, I. & K.....₱ bbl. $2.45@$2 78
Rosin, M. & N.....₱ bbl $2.85@$3.10

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₱ sqr.....$3.25@$4.50
Pen Argyle, ₱ sqr.....3.70@ 4.00
Peach Bottom, ₱ sqr.....4.75@ 5.60
No. 1 Chapman, ₱ sqr.....3.90@ 4.25
Lehigh Slates, ₱ sqr.....3.00@ 4.50
Vermont:
Sea Green, ₱ sqr.....2.50@ 2.75
Purple, ₱ sqr.....3.50@ 4.50
Unfading Green, ₱ sqr.....3.50@ 4.00
Red, ₱ sqr.....9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼.....13½@14¢
No. 1.....11¾@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.
f.o.b. New York.
In barrels, ₱ ℔.....4¢
Smaller quantities, ₱ ℔.....5¢

Gedney's Soldering Fluid.
In carboys or barrels, ₱ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.
Bbls., about 500 ℔, ₱ ℔.....3½¢ } 5 dis.
½ bbls., about 300 ℔, ₱ ℔.....4¢ }
Kegs, about 110 ℔, ₱ ℔.....4¢ }
75¢ extra for keg.
Kegs, about 55 ℔, ₱ ℔.....4¢ } 5 dis.

Yager's Soldering Salts.
½-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₱ ℔.....21½¢@22¢
Straits, pigs, ₱ ℔.....20½¢@21¢
Straits in bars, ₱ ℔.....21½¢@22¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20....$7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20.....5.50
" IX, 14 x 20.....6.75
Apollo Roofing, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.50
Atlantic, IC, 14 x 20.....5.75
Bonus, Extra Coated, IC, 14 x 20...6.75
" " " IX, 14 x 20....8.25
Buckeye, IC, 14 x 20.....7.00
" IX, 14 x 20.....8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20.....5.37½
Climax, IC, 14 x 20.....5.50
Columbia, IC, 14 x 20.....7.00
Dane, IC, 14 x 20.....5.50
DeMitt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20.....5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28.....15.00
Empire, IC, 14 x 20.....5.75
Extra Central, IC, 14 x 20.....5.62½
Flag, IC, 14 x 20.....5.25
Flushing, IC, 14 x 20.....7.00
Freeport (Hand dipped and Resquared).
IC, 14 x 20.....7.50
IX, 14 x 20.....8.75
Globe, IC, 14 20 x 28.....11.00
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20.....5.75
Kensington, IC, 14 x 20.....6.75
" IX, 14 x 20.....8.00
Knoxall, IC, 14 x 20.....6.00
Laufman's Apollo (Resquared), IC, 14 x 20.....8.12
Laufman's Apollo (Resquared), IX, 14 x 20.....9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20.....6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20.....7.00
Maple, IC, 14 x 20.....6.50
Merchant's Roofing (Resquared), IC, 14 x 20.....8.25
Meurer Roofing, IC, 14 x 20.....8.50
" " IX, 14 x 20.....10.50
Newcastle Real Old Method, IC, 14x20, 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.25
N. F. Old Style, IC, 14 x 20.....7.50
" " IX, 14 x 20.....9.00
Old Colony, IC, 14 x 20.....8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20.....5.25
Palaclo, IC, 14 x 20.....5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20.....8.00
Phœnix, IC, 14 x 20.....5.62½
Pullman, IC, 14 x 20.....6.50
Scott's Extra Coated (Resquared), IC, 14 x 20.....9.25
Scott's Extra Coated (Resquared), IX, 14 x 20.....10.75
Stanley, IC, 14 x 20.....5.50
Superior, IC, 14 x 20.....5.25
Taylor Old Style (Resquared), IC, 14 x 20.....9.25
Taylor Roofing, IC, 14 x 20.....8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20....6.00
" IX " 14 x 20....7.25
U. S. Monongahela, IC, 14 x 20.....6.10
U. S. Redipped, IC, 14 x 20.....8.25
Venus, IC, 14 x 20.....5.37½
Vigilant, IC, 14 x 20.....5.50
Waldo Redipped, IC, 14 x 20.....6.75
Westmoreland, IC, 14 x 20.....6.25
Willow, IC, 14 x 20.....6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Brooklyn, IC, 14 x 20.....5.50
Climax, IC, 14 x 20.....6.00
" IX, 14 x 20.....7.50
Excelsior, IC, 14 x 20.....6.50
" IX, 14 x 20.....7.50
Florence, IC, 14x20.....6.75
Florida, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Hazel, IC, 14x20.....6.50
Iowa, IC, 14 x 20.....5.75
" IX, 14 x 20.....7.00
Linden, IC, 14x20.....6.50
Merchant's Dipped, IC, 14x20.....11.00
Merion, IC, 14x20.....6.75
Mint, IC, 14x20.....6.00
Newcastle Russia, IC, 14 x 20.....7.00
" " IX, 14 x 20.....9.00
Newcastle Junlati, IC, 14 x 20.....6.50
" " IX, 14 x 20.....8.50
Newcastle Best Coke, IC, 14 x 20....6.00
" " IX, 14 x 20....7.25
Newcastle Coke, IC, 14 x 20.....5.50
" " IX, 14 x 20.....6.75
Palma Xtra, IC, 14x20.....7.25
Phœnix, IC, 14x20.....6.25
" IX, 14x20.....7.75
Royal, Extra, IC, 14x20.....7.00
U. S., IC, 14x20.....7.25
Versailles, IC, 14 x 20.....5.75
Youghiogheny, IC, 14 x 20.....6.00

Imported Terne Plates—

Charcoal.
MF Grade, IC, 14 x 20.....$7.50
20 x 28.....15.00
IX, 14 x 20.....8.75
20 x 28.....17 50
Pontymister Grade, IC, 14 x 20.....6.50
20 x 28.....13.00
IX, 14 x 20.....7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20.....$5.75
20 x 28.....11.50
IX, 14 x 20.....6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20.....5.40
20 x 28.....10.80
IX, 14 x 20.....6.40
20 x 28.....12.80
Abercarne Grade.—IC, 14 x 20.....5.25
20 x 28.....10.50
IX, 14 x 20.....6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₱ ℔.
Melyn and Cal-land Grade. IC, 10 x 14.....$6.35
" " IC, 12 x 12.....6.60
" " IC, 14 x 20.....6.85
" " IC, 20 x 28.....12.70
" " IX, 10 x 14.....8.00
" " IX, 12 x 12.....8.20
" " IX, 14 x 20.....8.00
" " IX, 20 x 28.....17.00
" " DC, 12½ x 17.....6.00
" " DX, 12½ x 17.....8.00
Allaway Grade. IC, 10 x 14.....5.75
" " IC, 12 x 12.....5.85
" " IC, 14 x 20.....5.75
" " IC, 20 x 28.....11.50
" " IX, 10 x 14.....7.00
" " IX, 12 x 12.....7.25
" " IX, 14 x 20.....7.00
" IX, 20 x 28.....14.00
" DC, 12½ x 17.....5.50
" " DX, 12½ x 17.....6.50
Coke.
Steel Coke.—IC, 10x14, 14x20.....5.35
10x20.....8.25
20x28.....11.00
IX, 10x14, 14x20.....6.60
B. V. Grade.—IC, 10x14, 14x20.....5.40

Imported Boiler Plates.—

IXX, 14x26..(112 sheets).....$13.35
IXX, 14x28..(112 sheets).....14.50
IXX, 14x31..(112 sheets).....16.00

Tinning—Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks Stove—

Improved Lock Frame, per doz... $15.00
Steel Lock Frame, per doz.....18.00
Daisy Improved Pattern, ₱ doz.....18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....50&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 18.2..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks.....₱ ℔ 5½¢
Per ℔.....6¢

It Is Reported—

Arizona.

That Dawson & Fiske are a new Hardware firm at PHŒNIX.

Florida.

That C. F. Hamblen, ST. AUGUSTINE, has just commenced the erection of a store building adjoining his warehouse which, when completed, will give him about 25,000 square feet of floor space and abont 10,000 square feet of shelving.

Georgia.

That the Lowry Hardware Company, ATLANTA, have purchased the Bicycle stock and business of the Nunnally Company.

Illinois.

That G. G. Shearer is about to engage in the Hardware business at MAQUON.

Indiana.

That R. R. Cranmer's Hardware store. at FRANKTON, was destroyed by fire on the 10th inst.

That the Marion Hardware Company, MARION, have been incorporated, with a capital stock of $12,000.

That the safe in the Hardware store of Fishel Bros., HOPE, was blown open and robbed early on the morning of the 12th inst.

Iowa.

That W. D. Rust has recently entered the Hardware business at WEBSTER CITY.

Maine.

That the firm of Stickney & Wiggin, Stove dealers, BELFAST, have been dissolved, Mr. Stickney having bought out his partner. The business will be continued by Mr. Stickney alone.

Minnesota.

That Huntington Bros. are a new Hardware firm at LUVERNE. C. E. and G. L. Huntington are the members of the firm.

That Hunt A. Wyer has purchased the stock of Joseph Helm, Hardware merchant, at RED LAKE FALLS. The price paid was $5000.

That George Wolheter's Hardware store, at ALBERT LEA, was damaged by fire on the 31st ult. to the extent of $1500.

That thieves broke into the Hardware store of Fuller & Denning, PARK RAPIDS, on the 3d inst. and stole about $75 worth of Guns, Revolvers, Knives, &c

New York.

That the Hardware store of E. E Parker, AKRON, was burglarized on the 8th inst.; $100 worth of Knives, Revolvers and Razors were taken.

Ohio.

That burglars visited the Hardware establishment of J. S. Abbott, at 115 South High street, COLUMBUS, on the 11th inst. and carried off about $150 worth of goods.

That C. Smith, formerly with Carter & Huckins, Hardware merchants, of OBERLIN, has removed to Belleville, where he has opened a Hardware store.

South Dakota.

That Booth Bros., MITCHELL, have disposed of their stock of Hardware to W. J. Healey. The new proprietor is referred to as one of the most energetic and capable business men in the vicinity.

Texas.

That Sutton & Sharp's Hardware store, at GEORGETOWN, was robbed on the 30th ult.

That the firm of Ragsdale, McKinney & Co., BONHAM, have sold their Hardware business to Chas. and Frank Davis and James Biggs, who will continue it under the firm name of Chas. Davis & Co.

That W. L. Vicker & Co.'s Hardware store, at WICHITA FALLS, was burglarized on the 5th inst., a lot of Razors and Guns being taken.

Price-Lists, Circulars, &c.

ONEIDA COMMUNITY, Kenwood, N. Y.: "How to Catch Wolves with the Newhouse Wolf Trap." A catalogue with illustrations of Traps describes what are referred to as the latest and most successful methods of catching wolves, as practiced by the professional trappers of the North American continent.

THE PHOSPHOR-BRONZE SMELTING COMPANY, 2200 Washington avenue, Philadelphia: "List of Current Qualities of Elephant Brand Phosphor-Bronze Alloys." The purposes for which the various grades are best adapted are described, and other particulars given which make the list valuable for reference.

TELEGRAM CYCLE MFG. COMPANY, Milwaukee, Wis.: Telegram Bicycles and Sanger racers. A catalogue shows Telegram machines in full roadsters, light roadsters and ladies' wheel; also the Lightning Messenger and Special Sanger racer.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

At once, a good TINSMITH and PLUMBER who can do general jobbing and roofing and make up tinware; must be of good habits; state experience, age and wages. Solenberger & Stouffer, Winchester, Va. June 23

Live, energetic salesman on commission, to handle sanitary appliances manufactured in vitreous china; no objection to one handling other lines, but must be thoroughly acquainted with master plumbers. Maryland Pottery Company, Baltimore, Md. June 23

At once, a good TINSMITH who can do general jobbing and roofing and make up tinware; must be used to country work; good job and good wages to the right man. C. Hoag & Son, Downsville, N. Y. June 16

SITUATIONS WANTED.

As SUPERINTENDENT of stamping works or FOREMAN die or tool maker; 35 years of age; last six years in similar position with leading firm; thoroughly posted in sheet metal of all kinds; highest references. "Tools," care Rudolphi & Krummel, 96 North Clinton street, Chicago, Ill. June 23

Steady job in a HARDWARE STORE and tin store or tin shop; can make ordinary tinware goods, or roofing and spouting; best of habits. J. H. Bowers, Wakerton, Ind. June 23

As SALESMAN in a hardware or iron house; 20 years' experience in shelf and heavy hardware, tinners' stock, iron and carriage goods. "Storrs," office of *The Metal Worker*, Rooms 22-24 Pickering Building, Cincinnati, Ohio. June 23

By a first-class PLUMBER who understands gas and hot water fitting; steady; sober; married; steady position desired; town or country. 37 Chestnut street, Yonkers, N. Y. June 23

As FOREMAN in an iron foundry, by a practical molder used to green and dry sand molding; can give good references. "Molder," No. 614, office of *The Metal Worker*, 96-102 Reade street, New York City. June 23

By a first-class PLUMBER, in city or country; neat lead worker; can furnish first-class references from last employers. Robert Edwards, 64 Grove street, New York City. June 23

By a first-class PLUMBER; city or country. C. J. Smallen, 64 West 101st street, New York City. June 23

First-class PLUMBER desires steady work; 25 years' experience; city or country. John Pratt, 630 Third avenue, New York City. June 23

By a first-class PLUMBER, STEAM and HOT WATER FITTER; can estimate and read plans; steady employment desired; wages moderate; first-class references; sober; married. "J. H. K.," 2501 Broadway, Kansas City, Mo. June 23

By a young man, who is capable of doing plumbing and gas fitting, roofing, guttering and spouting, range and pump work; can come well recommended; wages moderate for steady job; city or country. J. E. Moran, Box 21, Marlborough, N. Y. June 23

By a TINSMITH; in and out door worker; good hand on furnaces, ranges, heaters and roofing; some knowledge of plumbing; a good situation desired. Shneider, 288 Broome street, New York City. June 23

By a TINSMITH; willing to go anywhere. S. Soltzman, 146 Essex street, New York City. June 23

By a young man of experience, as TRAVELING SALESMAN; thoroughly acquainted with the hardware and house furnishing trade in Ohio, Michigan and Indiana; best of references; salary no object at start; permanent situation desired. "Smith," 530 Fourteenth avenue, Detroit, Mich. June 30

By a practical first-class PLUMBER; 15 years' experience; seven years in one shop; understands plans; first-class references; city or country; no objections to go South. Jos. Usher, 427 East 114th street, New York City. June 23

By a competent man of nine years' experience in the STEEL RANGE and FURNACE BUSINESS in all its branches; strictly temperate. John M. Blaydes, 2917 Thomas street, St. Louis, Mo. June 23

As FOREMAN or SUPERINTENDENT in a cornice and roofing shop; a first-class cutter and draftsman; also understands estimating on all kinds of cornice, tin and sheet iron work; have 20 years' experience; can give best of references. "Cutter," No. 62, office of *The Metal Worker*, 96-102 Reade street, New York City. June 23

By a first-class American STEAM FITTER and HOT WATER FITTER; married and temperate; very best of references given. "Steam Fitter," care of W. A. Taylor, 39 Myrtle street, Worcester, Mass. June 23

By a BRASS FINISHER; soft and hard solderer; city or country. S. Klein, care Mrs. Braun, 168½ Attorney street, New York City. June 23

By a TINSMITH, ROOFER and GENERAL JOBBER; will work for moderate wages; town or country. John Buckley, 109 Asterdam avenue, New York City. June 23

By a young man with eight years' experience at the tinners' trade; understands roofing, plumbing and furnace work; used to country work. "Tinsmith," 269 West Thirty-seventh street, New York City. June 23

By a first-class STOVE MOUNTER, DRILLER and FITTER, also PATTERN FITTER; six years' experience as foreman in one shop. Henry Guyer, 375 Central avenue, Albany, N.Y. June 23

By a practical TIN and SHEET IRON WORKER, who has learned his trade in Germany; capable of doing all work in the above line; 12 years' experience; city or country. Louis Kreutzman, 345 East Sixty-fifth street, New York City. June 23

By a TINNER and CORNICE MAKER; can cut patterns and do roofing, gas fitting, heater and furnace work; steady work desired; wages moderate. Edward Johnson, Cairo, Ill. June 23

PLUMBER, a first-class man, 12 years' city experience, desires position out of New York City; will furnish very best reference. Alex. Gillespie, 135 West 101st street, New York City. June 23

To travel (in New England preferred) with a line of heating apparatus; well versed in hot air and a good knowledge of hot water and steam; ten years in constructing and selling to the retail trade. "B," 40 Carroll street, Worcester, Mass. June 23

By a thoroughly practical TIN, SHEET IRON and COPPER MAKER who understands roofing, furnace and iron pipe work and general new inside and outside work; 13 years' experience; 27 years of age; strictly temperate; capable of buying and selling hardware, house furnishing goods, &c.; moderate salary. P. O. Box 100, Hartford, Conn. June 23

By a TINNER who can do roofing, bench and furnace work; temperate and reliable; not afraid of work; would like a steady position where he could learn pipe fitting; Massachusetts preferred. "Tinner," 141 Cabot street, Lowell, Mass. June 23

By a first-class TINNER who can do cornice work and assortment ware; can cut patterns. Fred. Freivozel, 83 Walker street, Cincinnati, Ohio. June 23

By a practical, all around MECHANIC in all branches of the tinsmith trade; can do roofing, piping, furnace and pump work and general jobbing; capable of taking charge of shop; steady and reliable; married. "German," care A. Maass, 339 East Twenty-second street, New York City. June 23

By a young man 21 years of age, as PLUMBER; three years' experience and four months' course in the New York Trade School; would like to work under instructions for a year; will furnish own tools. Wm. Peterson, 341 Park avenue, Hoboken, N. J. June 23

TIN and SHEET IRON WORKER accustomed to inside and outside work would like a steady job; inside work preferred; wages moderate. Thomas Wall, 200 Navy street, Brooklyn, N. Y. June 23

By a first-class PLUMBER in all branches of the trade; quick and neat worker; country preferred. P. J. Dervin, 159 West Sixty-sixth street, New York City. June 16

In New York City or Brooklyn, by an A1 TIN and SHEET METAL WORKER; thoroughly familiar with range and furnace work in all its details; is employed at present, but would like to make a change; can furnish the best of references. "M. W. P.," office of *The Metal Worker* 96-102 Reade street, New York City. June 16

By a first-class STOVE PATTERN MOLDER; thoroughly posted in all departments of the business; steady position; can give first-class references. "Pattern Molder," office of *The Metal Worker*, 96-102 Reade street, New York City. June 16

By a young man in a tin shop where he can be under instructions; two and a half years' experience; some knowledge of plumbing; good references. "B. A.," Box 260, Mount Morris, N. Y. June 16

By a first-class plumber as FOREMAN; good gas, steam and hot water fitter; steady and reliable; can estimate on work; conversant with the sanitary laws; references. "Plumber," Mount Vernon P. O., N. Y. June 16

By an A1 PLUMBER, GAS, STEAM and HOT WATER FITTER; well posted in estimating and laying out work; willing to work by the day or on commission; best of references; will go to any part of the country. Jones Wilson, Jackson, Mich. June 16

By a TINSMITH accustomed to assortment work; some knowledge of jobbing; position desired in some job or furnace shop; wages moderate; sober and reliable. J. Gibbon, 9 Fremont avenue, Somerville, Mass. June 16

By a first-class PLUMBER; capable of taking charge; also a good general jobber; two years with last employer as foreman; will go anywhere for steady position. J. M. Larkins, 48 Cannon street, Poughkeepsie, N. Y. June 16

By a young man 20 years old, with three years' experience at plumbing and gas fitting; also some knowledge of tin, sheet iron and range work; will go anywhere; wages moderate. F. Martin, 331 North Eleventh street, Philadelphia, Pa. June 16

By a PLUMBER and GAS FITTER; in city or country; wages, $2.75 per day. Albert Dorer, 491 Tenth avenue, New York City. June 16

By an all round TINNER; good at country jobbing and furnace work; strictly sober and reliable; steady work desired the year round. "G. E.," Box 487, Bethel, Conn. June 16

By PLATER of 14 years' experience in all branches of plating; have A1 dynamo polishing machines, buffs, &c., suitable for any class of work; will go to any place where steady work can be furnished; contract or salary; best of references. C. H. Smith, 1600 Division street, Burlington, Iowa. June 16

By an A 1 TINSMITH; good milk can maker; inside and outside jobbing tinware; understands all about country work, pumps and creamery work, heater, stove, spouting and roofing; moderate wages; sober, steady and trusty; country preferred; references given. F. M. La Seur, 489 Pearl street, New York City. June 16

By a first-class PLUMBER and GAS FITTER, who understands steam fitting and tin roofing; good jobber. D. McCarthy, 155 Allen street, New York City. June 16

By a strictly moral young man, where he can finish learning the tinner's trade; one years' experience; best of references; have also had experience in clerking; will Milwaukee parties please answer again. "H. K.," P. O. Box 366, Delavan, Wis. June 16

As FOREMAN of a tinware factory by a man with 15 years' experience, who can handle any number of men and understands presses and repairing dies, &c.; can furnish best of references, both as to character and ability. C. F. Bemis, Waucoma, Iowa. June 16

By the year, by a TINSMITH and PLUMBER; competent to do any job; steady; married; good references. Box 193, Newark, N. Y. June 16

By a mechanic, as TRAVELING SALESMAN in connection with the hardware trade; specialist on gasoline and oil gass heating; moderate salary for the first year; New York territory; references. Box 193, Newark, N. Y. June 16

By a PLUMBER; city or country. Thos. J. McDonnell, 236 East Thirty-sixth street, New York City. June 16

Young man; fair education; good salesman; thoroughly acquainted with oil and gasoline stoves; desires position as TRAVELING SALESMAN; good references given. C. F. Hotchkiss, Room 12, Cutler Building, New Haven, Conn. June 16

By a first-class TINSMITH at inside and outside work; general jobber. J. Kleinberger, care S. Herrman, 433 State street, New Haven, Conn. June 16

By an iron PATTERN FITTER, in stove works; 20 years' experience at stove, steel range and hot air heater patterns; have had charge of a pattern shop; sober and steady; good references; married. F. J. Koglin, 99 Wohlers avenue, Buffalo, N. Y. June 16

By young man with 12 years' experience as bookkeeper and sales clerk in retail hardware and stoves; speaks English, Swedish and some German; wages not as much of an object as a steady position. "G. S.," 1056 Milwaukee avenue, Chicago, Ill. June 16

By a STEAM and HOT WATER FITTER; first-class workman; sober. John S. Keefe, 316 W. Thirty-fifth street, New York City. June 16

By a practical TINSMITH, TIN and SHEET IRON WORKER; roofer and general jobber; 18 years' experience; city or country. H. Gold, 92 Essex street, New York City. June 16

Special Notices.

FOR SALE.

The Bellman Water Tube Boiler manufactured at Hagerstown, Md., will be substituted for the No. 8½ Double Firepot Bolton Hot Water Heater in the Keeley Institute at Laurel, Md. The Bolton is for sale at a reduced price. Its rated capacity is 2200 square feet direct radiation. Has been in use only one season. Address JAMES T. HARBIN,
Hagerstown, Maryland.

FOR SALE.

A first-class Tin and Stove Business. Located on the best street in the borough. A business established thirty years. Inventory about $2500. Reason for selling, bought out another business. For full particulars inquire of
YEOMANS BROS.,
Southington, Conn.

Wanted to Purchase

8 or 10 ft. Cornice Brake, 10 ft. preferred. Also Squaring Shear, to cut not less than 10 ft. 6 in.

THE CAMBRIDGE ROOFING CO.,
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Hardware, House Furnishing Goods, Roofing and Stove business. Plenty of work.
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11 Hull St., Brooklyn, N. Y.

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It is often advisable or necessary to sell Mill and Factory property at Public Auction We take entire charge of auction sales of manufacturing property, both real estate and plant, in all parts of the country, for owners, receivers, assignees and administrators. Particulars on application.
E. DEFOREST SHELTON & COMPANY,
Specialists Manufacturing Property,
Stewart Building, 280 Broadway, New York City.
Mill and factory property negotiated.

WANTED TO PURCHASE.

A Plumbing and Tinning business in a good sized country town. State particulars and price. M. J. RUSSELL, Convent, N. J.

FOR SALE.

A few more Tinners' Tools.
BOX 65, Scottsville, N. Y.

FOR SALE.

Stove and Tin Store, including a full set of Tinners' Tools, Patterns and Machines, also complete set of Copper Tools, in a city of 33,000. Situated in the best part of Ohio. Doing an elegant business. Sole agent for leading stoves. Elegant clean store room and stock. Have work of largest manufacturers here. Will sell at invoice price. This is a chance of a lifetime to a good man. Address "INVOICE PRICE," office of *The Metal Worker*, 96-102 Reade St., N. Y.

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An established Steam, Hot-water, Plumbing, Tin and Sheet Iron business, in connection with which is also carried a line of hardware, paints, oils and varnish. Stock will inventory about $6000. Furnishes employment for two men besides myself. Further particulars can be obtained by addressing
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office of *The Metal Worker*, 96-102 Reade St., New York.

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The Williams Printing Co.,

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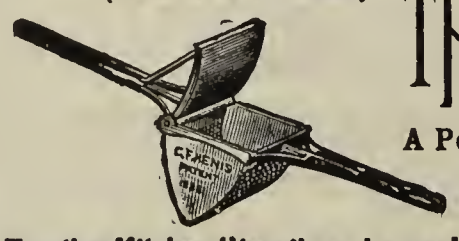
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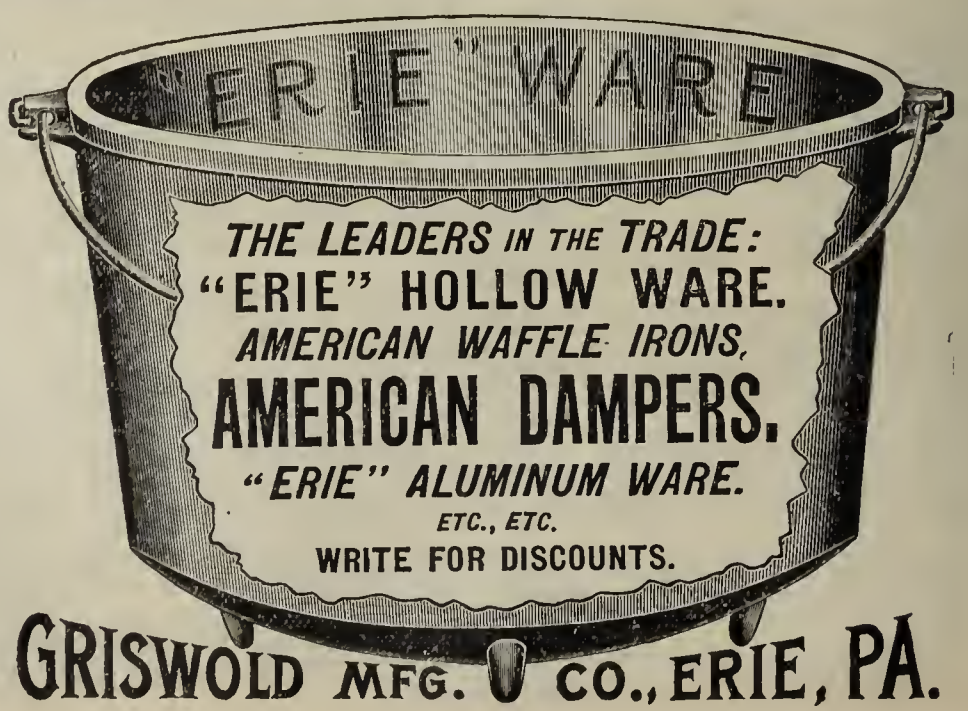
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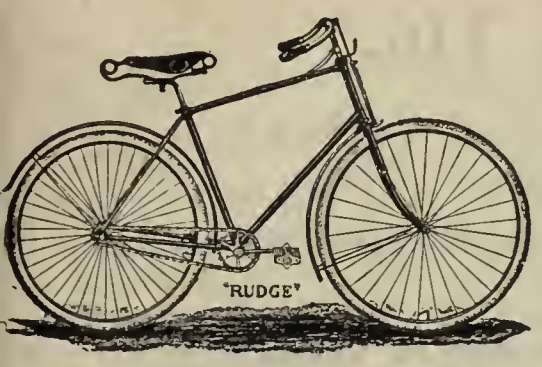
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Handsome New Designs.

Double Walled. Packed.

No. 82,	2	gals.	$3.40
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" 84,	4	"	4.50
" 86,	6	"	5 60
" 93,	3	"	4.60
" 94,	4	"	5.25
" 96,	6	"	6.50
" 98,	8	"	7.75
" 110,	10	"	12.50
" 114,	14	"	16.75

Discounts Furnished upon Request.

Sidney Shepard & Co.,
BUFFALO, N. Y

C. Sidney Shepard & Co.,
CHICAGO, ILL.

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ESTABLISHED 1853.

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"Yes."

"The one asking you to be mine?"

"Yes."

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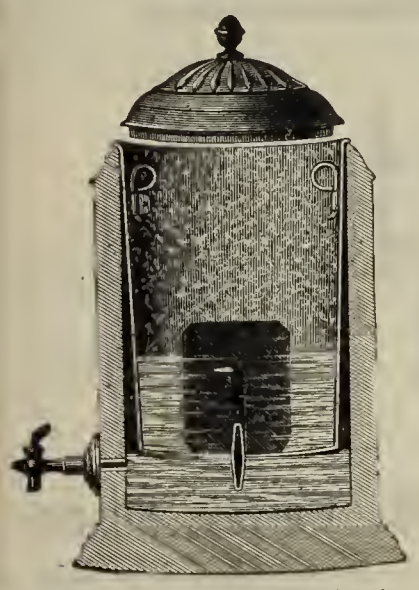
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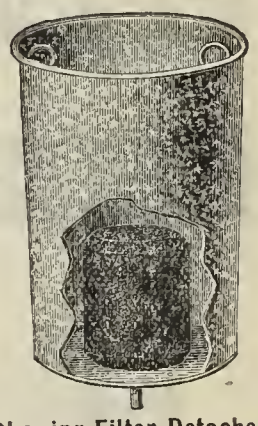
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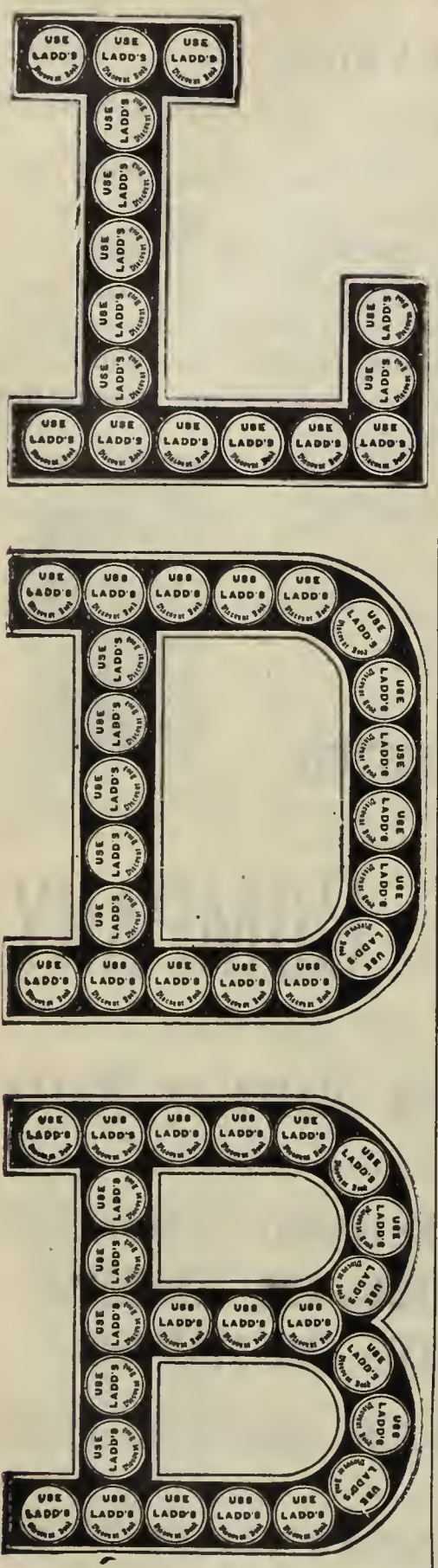
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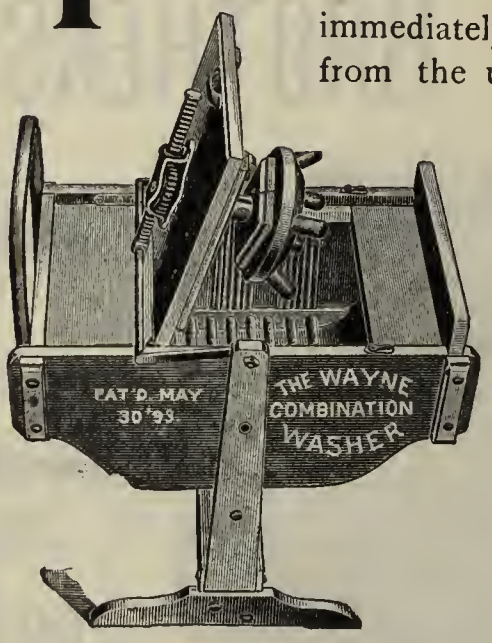
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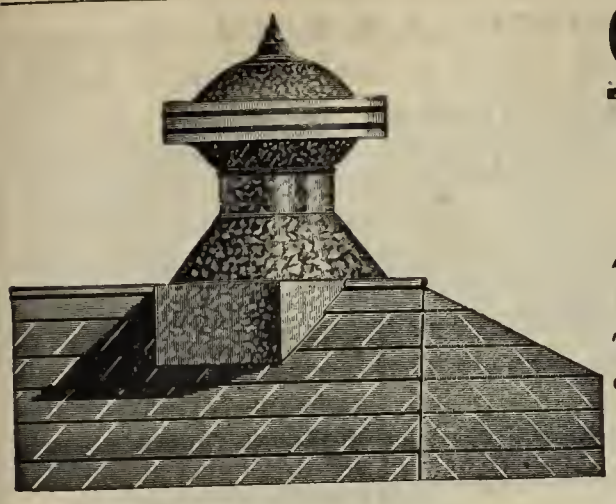


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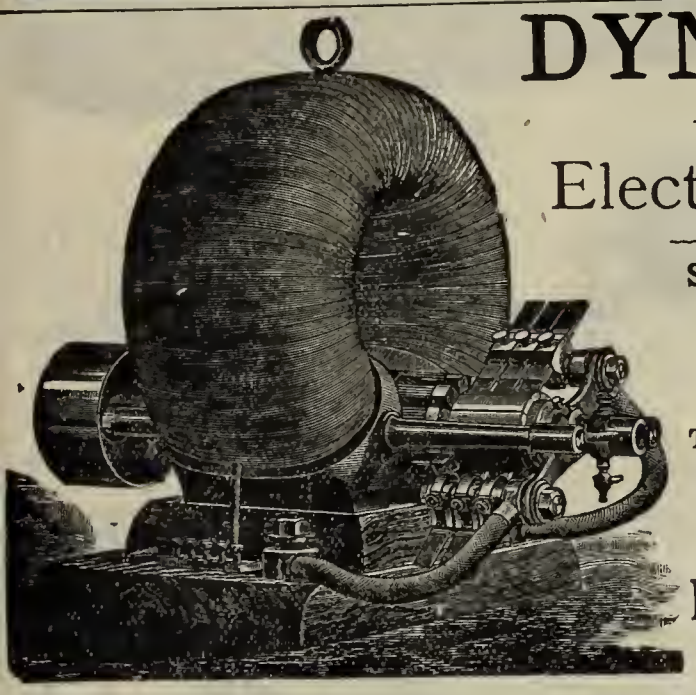
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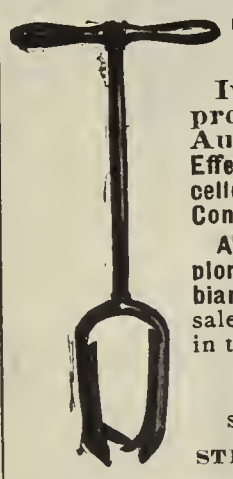


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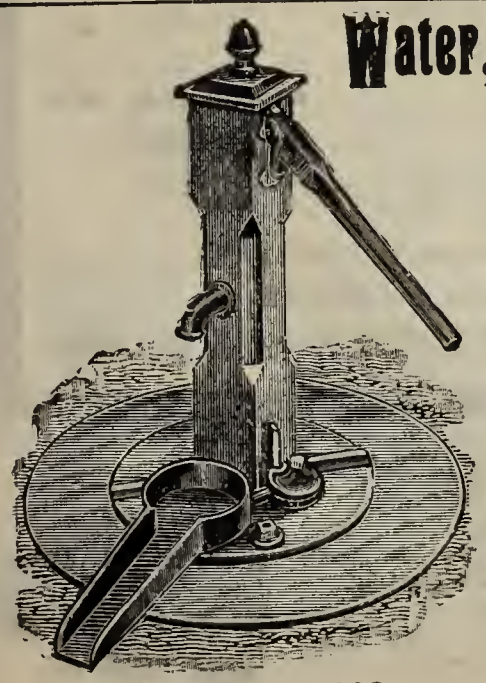
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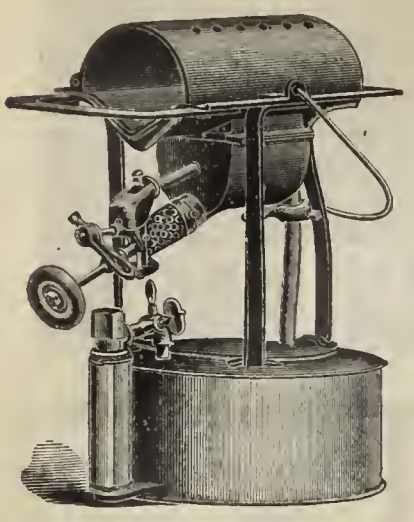
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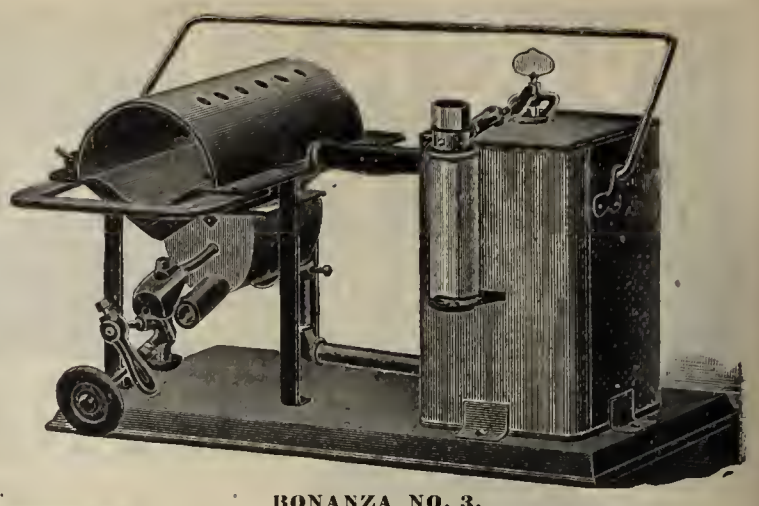
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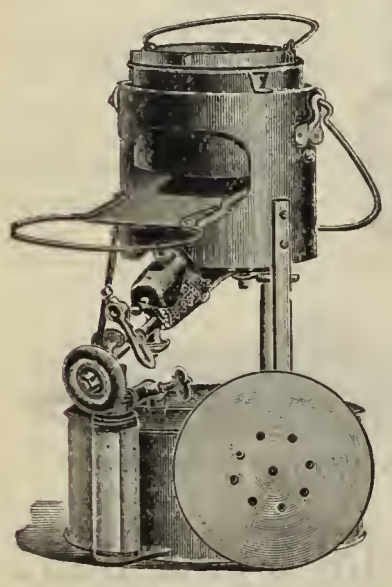
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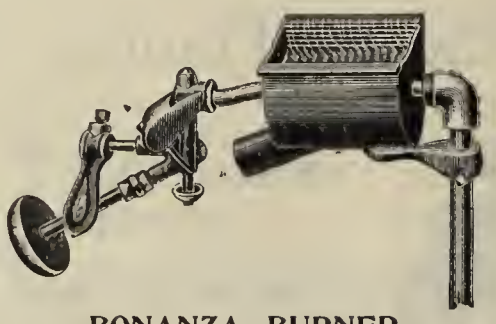
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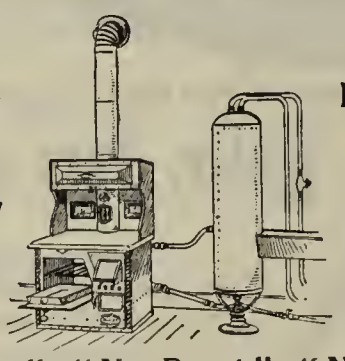
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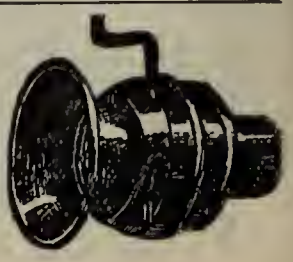
W. R. OSTRANDER & CO.,

204 FULTON STREET, NEW YORK.

Manufacturers of

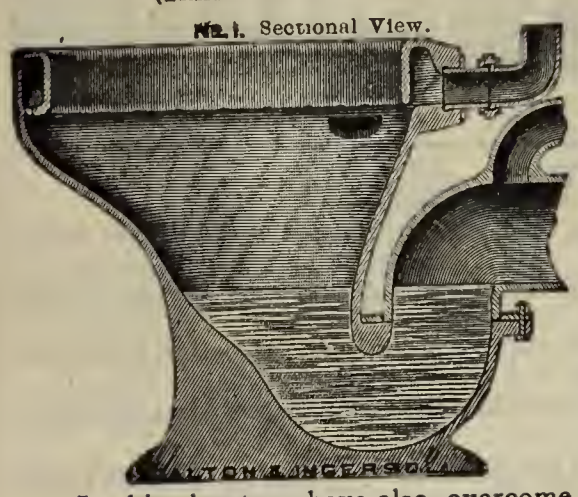
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Complete outfits of Speaking Tubes, Whistles, Pneumatic Bells, &c. A full line of Speaking Tube Hardware constantly on hand. Factory, DeKalb Ave., near Knickerbocker, Brooklyn, L. I. Catalogues on application.



BOSTON HOPPER WATER CLOSET.

(TRADE-MARK.)



The bowl contains a pool of water 7 x 6 inches. This is a much larger pool of water than has ever been obtained heretofore in the Short Hopper principle; and until now it has been considered an impossibility to construct a Short Hopper with a large standing pool of water that would discharge its contents. This we do in the *Boston Hopper* with the same amount of water that is required to flush an ordinary Short Hopper. In this closet we have also overcome the objectionable and dangerous connection between the earthen trap and soil pipe. The outlet of the *Boston Hopper* is so constructed that the point of connection between the trap and soil pipe is under the water line, and being submerged it must be absolutely tight against the leakage of sewer air. (For full view see our advertisement last week.)

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THE STEEL CLAD BATH

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No other lettering on them.

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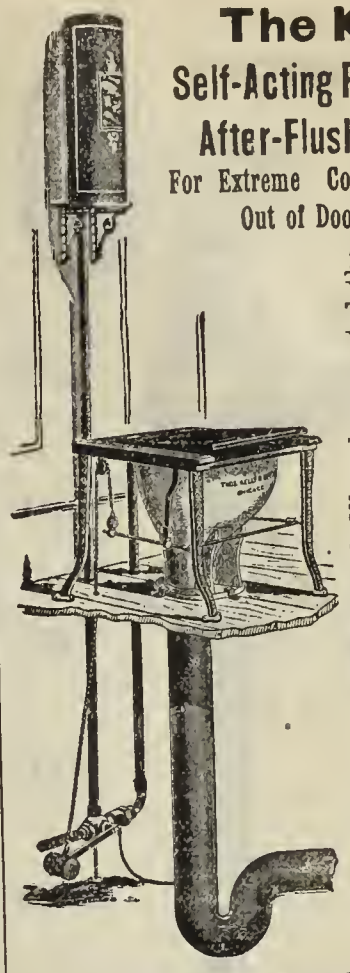
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Slate in all Forms also Slate Mantels.

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For Extreme Cold Places and Out of Door Work.

When the seat is occupied the tank fills, when vacated the water in the tank discharges into the closet. The pipe and valve drain into the trap, as shown, leaving no water above freezing point, it matters not at what height above the seat the tank is placed.

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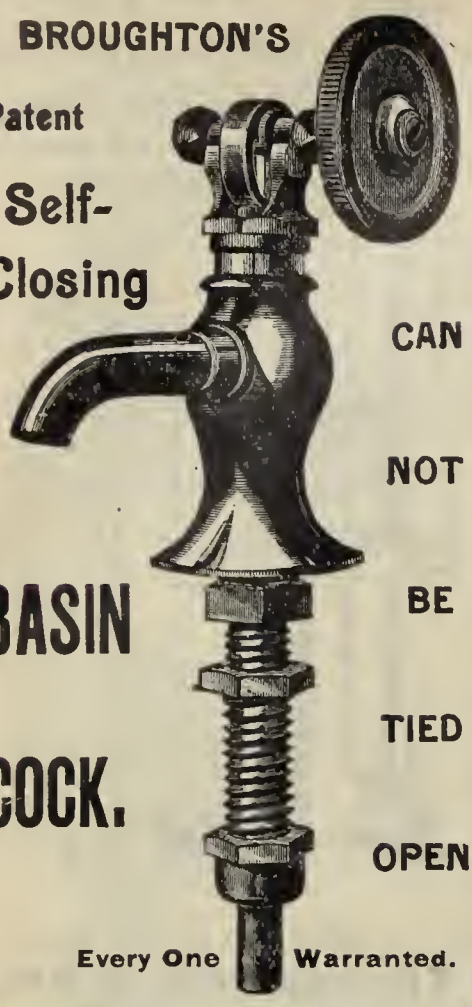
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COSTS MORE **BUT!**

Lasts a lifetime and doesn't require strength of a giant TO WORK IT

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*Maule's "Skeleton" Pipe Die

If You Wish to Avoid

A Pipe-Threading Die extremely easy of operation by reason of the **proper clearance** of its cutters;

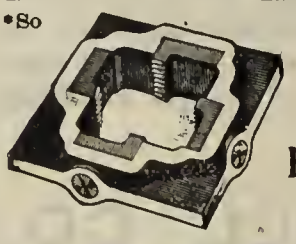
Of surpassing **durability** secured by the accurate and uniform **temper** of said Cutters;

Having Cutters that when dull may be removed in a moment, and **sharpened on a grindstone or emery wheel;**

Of phenomenal **cheapness,** arising from **small first cost** coupled to **excellence** of quality.

If by chance you do not think these points, or the saving of money, objectionable,

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Send us a **Postal Note for 62 Cents** (do not send us any postage stamps), and we will mail you a sample one-inch Die, either 2⅜ or 2½ x ¾ thick, which we hereby agree to take back if not to your satisfaction.

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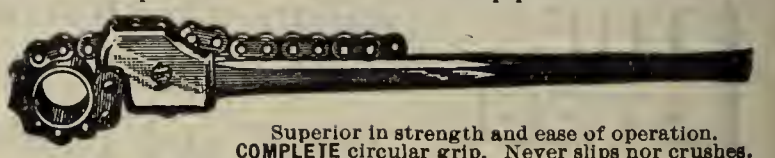
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All parts interchangeable.

Grips firmly without loss of motion. Releases readily. Never locks. Causes no trouble in close quarters. Does not crush the pipe.

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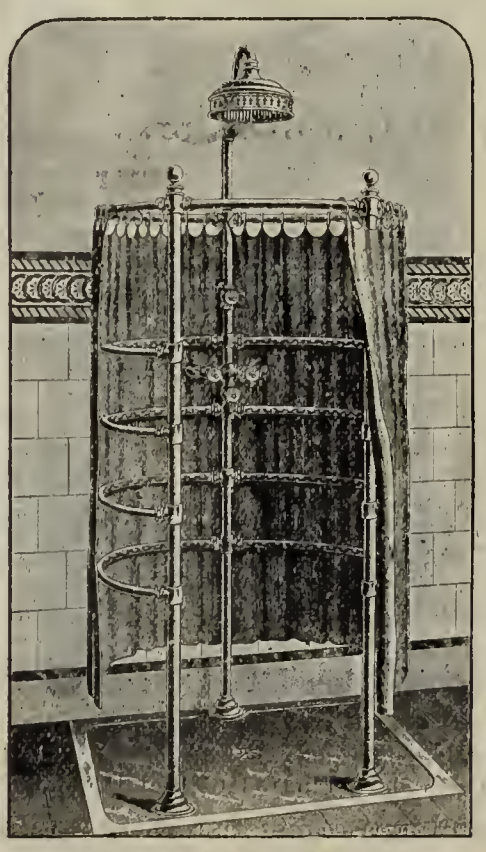
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Can be used with one hand and in closer quarters than any other Basin Wrench. Parts Interchangeable.

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TRIMONT MFG. CO., ROXBURY MASS.



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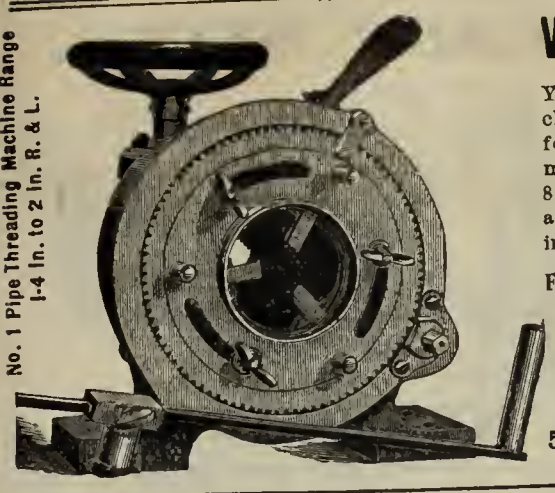
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This reduced cut, Fig. 218, is only one of hundreds of others.

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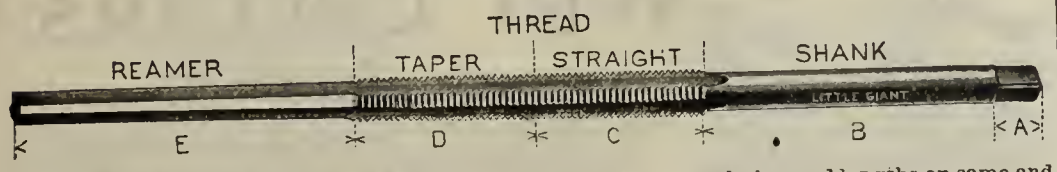
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OUR BANGOR UNION, ALBION & MAMMOTH VEIN QUARRIES
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Requires no attention.

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It is the only Cut-off that can be used in any position without extra pipe. Try them, and you will use no other.

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3-inch sample, by mail, 40 cts. in stamps.
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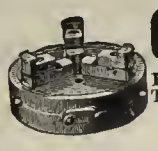
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WITH THIRTY-FIVE ILLUSTRATIONS.

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This book contains a reprint from *The Metal Worker* of two articles on the method of Joint Wiping, an operation calling for a very large degree of manual skill.

The first account is written by a practical plumber, and is illustrated from photographs faithfully representing the hands and tools when wiping joints in various positions.

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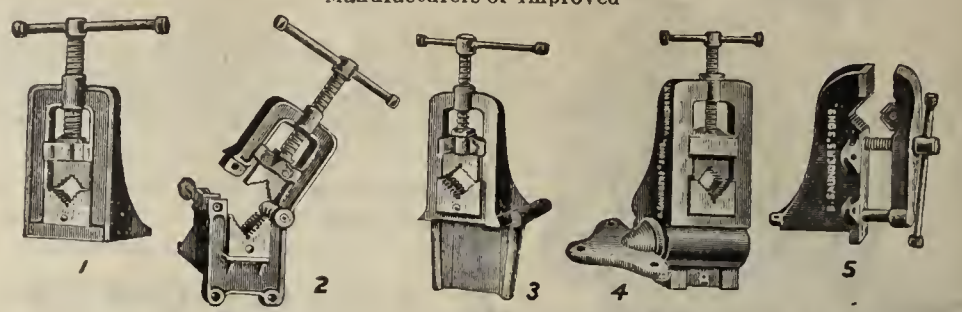
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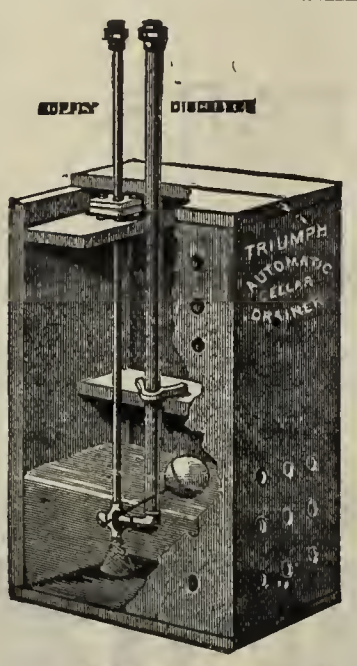
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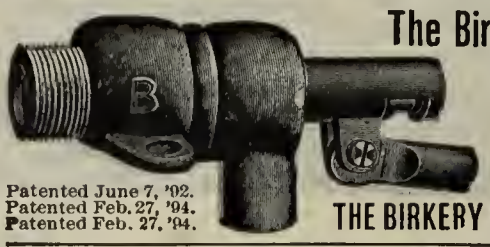
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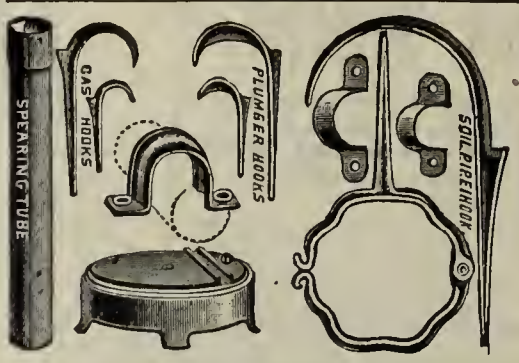
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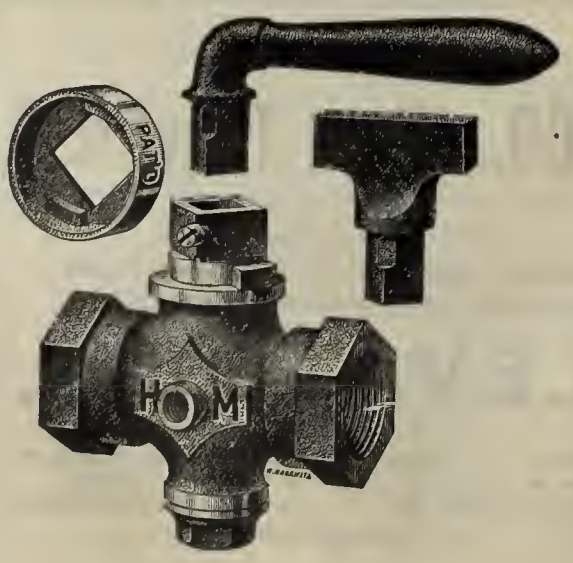
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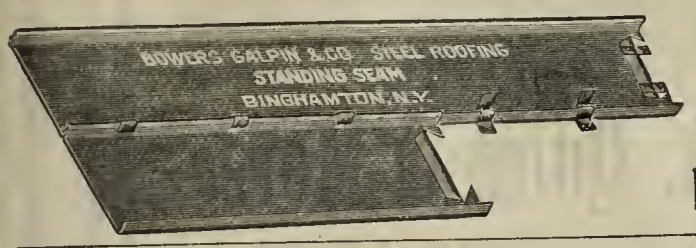
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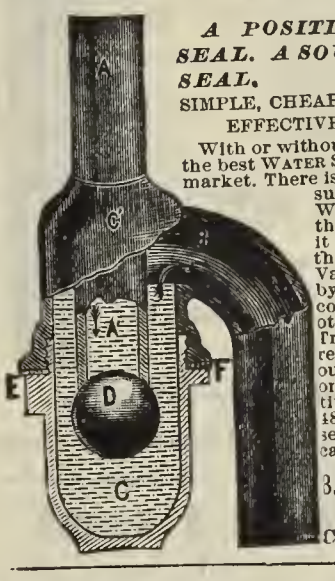
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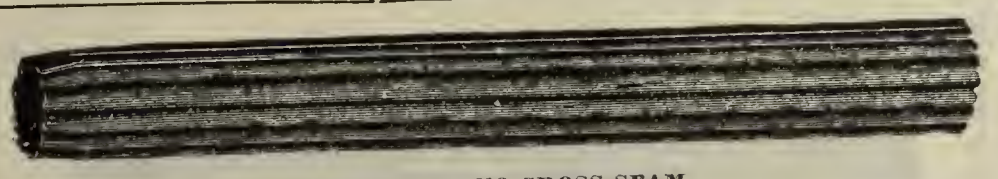


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SIMPLE, CHEAP.
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With or without the Valve, it is the best WATER SEAL TRAP in the market. There is no other Trap so sure of retaining its WATER SEAL; none that approximates it in the surety of the VALVE SEAL. The Valve keeps its seat by flotation, and as compared with other Valves and Traps is little or no resistance to the outflow of water or waste. Illustrative and descriptive 48-page pamphlet sent free on application.

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10 FT. LONG, NO CROSS SEAM.

CORRUGATED CONDUCTOR,

Round or Square. Standard Designs and Sizes. Stamped Elbows and Shoes.

Our make of Conductor is of superior quality, made on new machinery especially designed for the purpose

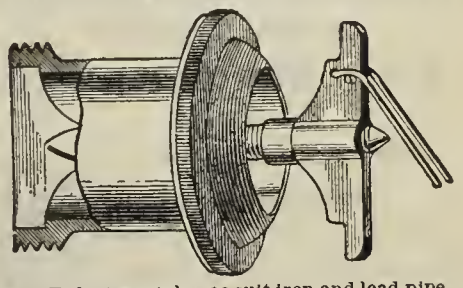
WRITE **US** FOR PRICES.

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CLOSET REPAIR COUPLING.

(Patent applied for.)



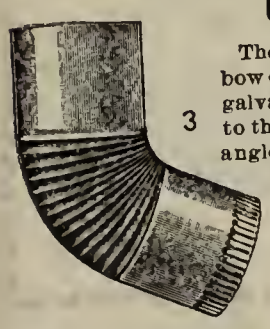
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TAKES the place of the old spud and necessitates no change in fixtures.

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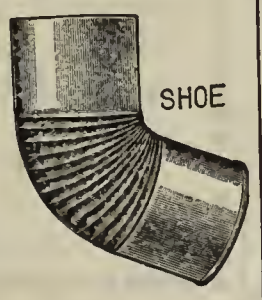
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PLAIN, ROUND and CORRUGATED



The "O. H." is the strongest and most durable elbow on the market. Made of the best steel plate and galvanized after formation. Prompt attention given to the manufacturing of special elbows of any size, angle or material. Write for prices.

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For Family Oil Cans, Etc.

(Patent applied for.)



The Faucet is constructed with a Plug set on an angle, making it very convenient, and has a double running thread. The liquid has a direct flow, which obviates oozing out through the threads; in fact, the objectionable points with other styles are overcome.

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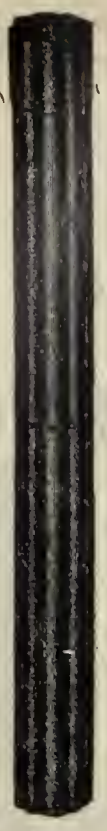
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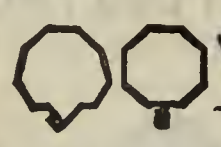
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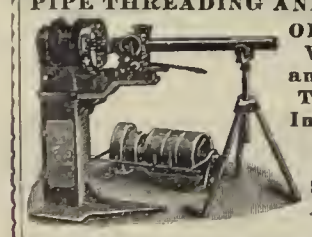


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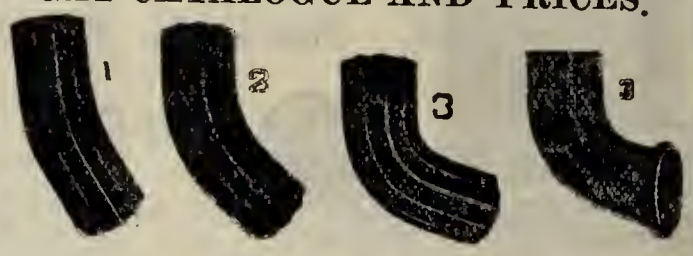
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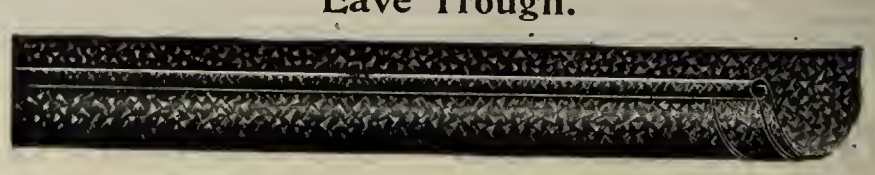
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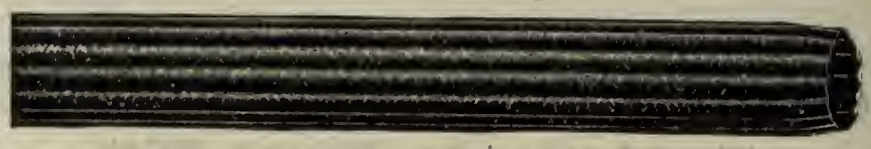




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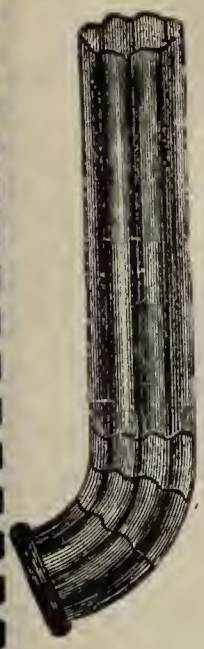


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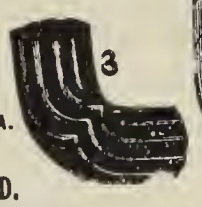
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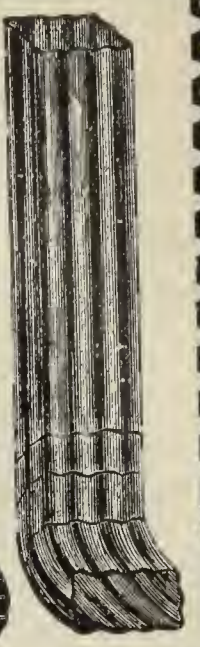
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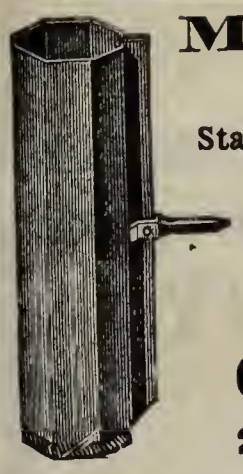
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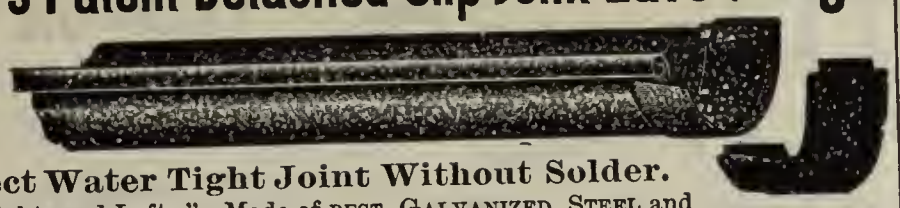
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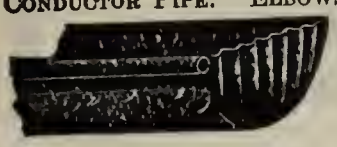
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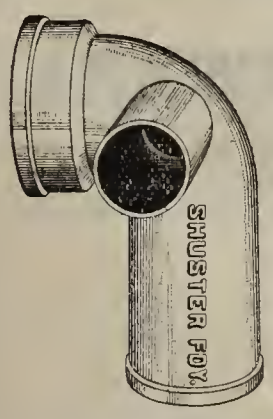
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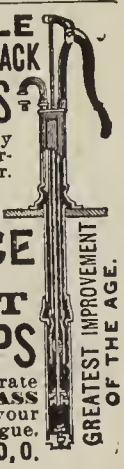
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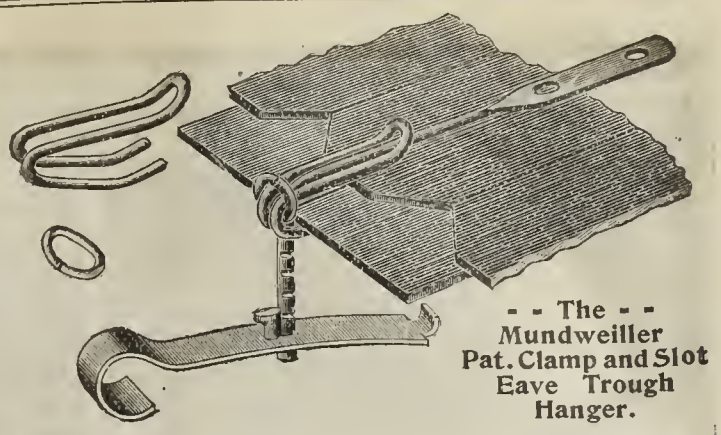
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We have had a number of inquiries for copies of the table giving the net price of galvanized sheet iron which was printed in *The Metal Worker* April 7. We have therefore issued the table in more permanent form, published on manilla card suitable for shop and office use. The card will be sent on receipt of 10 cents by

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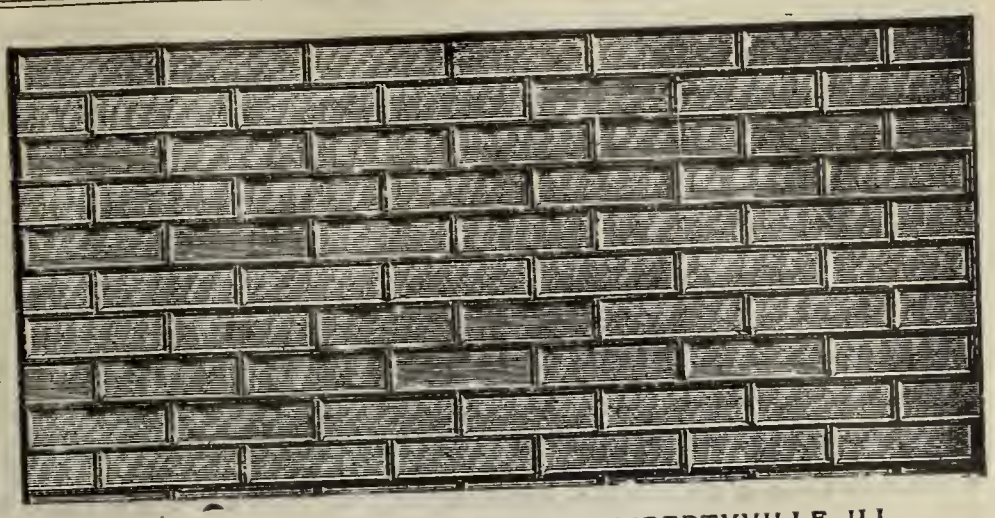
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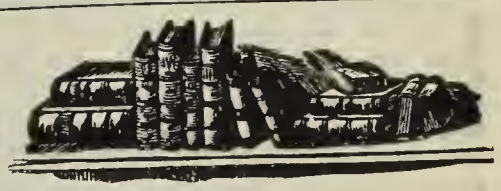
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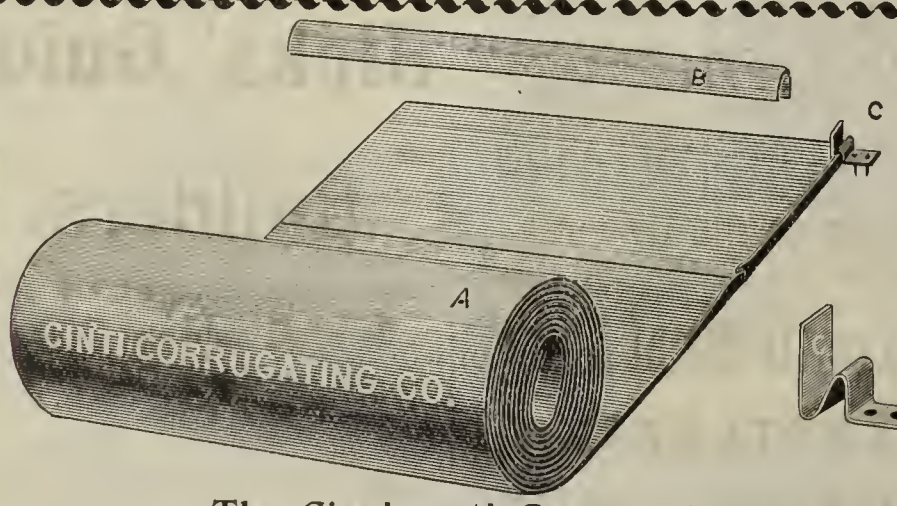
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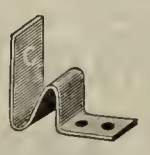
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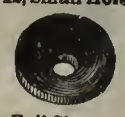


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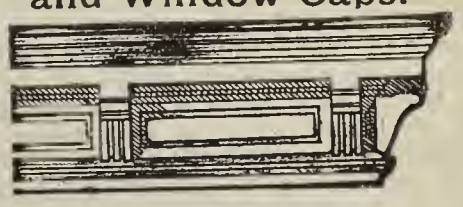
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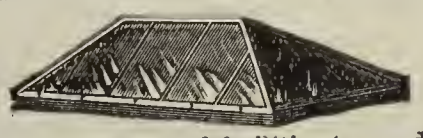
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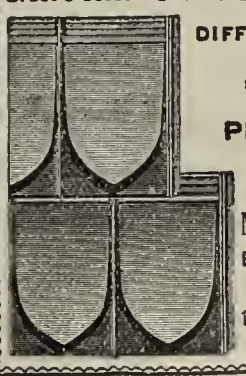
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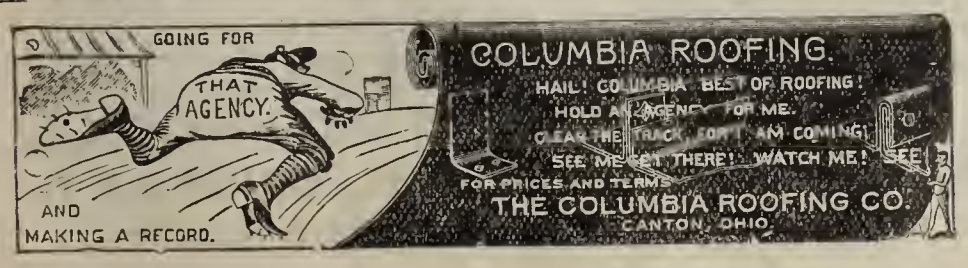
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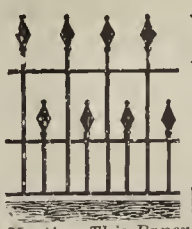
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Near Beekman Street, NEW YORK.

Aerial Locomotion.

The *Pall Mall Budget* records the fact that the problem of aerial locomotion is now occupying the thoughts and time of three eminent scientists. Prof. Alexander Graham Bell, the distinguished inventor of the telephone, has been grappling with aerial locomotion for some months past in Nova Scotia, and, like all the other experimenters in that science, he is very hopeful of success. He is not a believer in extreme lightness, but thinks that the solution of the problem lies in proper balancing. He has made machines that will fly to a hight of several hundred feet; but the motive power is acquired externally and motion cannot, therefore, be long continued. Moreover, there is no method of directing the apparatus while in the air. Prof. S. P. Langley, the director of the Smithsonian Institution in Washington, has much the same ideas as Professor Bell, and has followed very similar lines. In fact, these two investigators have worked together to some extent. Various means of propulsion have been tried, and among them slow burning gunpowder, which has been used successfully in propelling torpedo boats ; but the application to flying machines was undoubtedly novel when it originated in Professor Bell's fertile brain early this summer. In England Hiram Maxim is still busy with his great air ship. The principle he has adopted is that of the kite, sufficient surface being provided to enable the ship to float in the air when a minimum speed of 25 miles per hour has been attained The propelling force consists of two screws, operated in the usual fashion by a boiler and steam engine. Mr. Maxim declares that he will take his wife with him on his first trip.

— An Accomodation Train. — The Southern Express deposited one passenger in the evening dusk at the junction, and then flew on its way again. The lonely traveler took his bearings and then went over to a man in uniform, who proved to be a conductor, and pointing to a train standing a hundred feet away on the switch, inquired if it was the train "down the valley," and received an affirmative reply.

"What time does it go?" asked the traveler, anxiously.

"Scheduled for ten minutes back," was the answer of the conductor, looking at his watch. "Going down?"

"Yes," returned the traveler. "I must get to Smithsburg to-night. Thirty miles, isn't it?"

"Yes. Due there in three hours," said the conductor.

"Just my luck!" cried the traveler. "I haven't eaten for six hours, and—"

"There's a nice restaurant in the depot," said the conductor, with a shake of the head which, as a testimonial to the excellence of the restaurant, was all that could be desired. "You can get bully fried chicken and waffles."

"But, great Cæsar! you're ten minutes late now," wailed the unfortunate, "so what good does the restaurant do me?"

"Well, you go and eat," returned the conductor, "and I'll get an order from the superintendent to hold the train and wait for you."

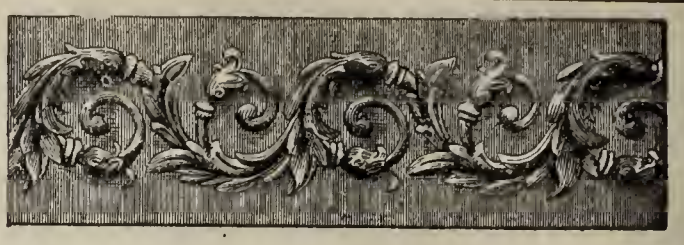
"But will he give the order?" cried the traveler, eagerly.

"Will he?" echoed the conductor. "Well, I just reckon he will. The superintendent himself keeps that restaurant, and he ain't letting no good chances slip for the sake of having the train on time." *Harper's Monthly.*

Squildig: "The piano next door makes me swear every time I hear it played."

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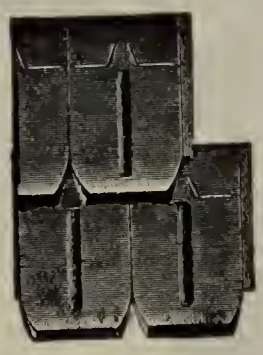
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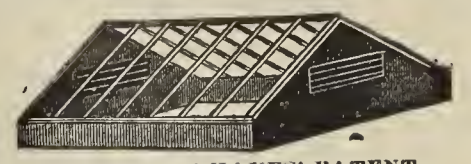


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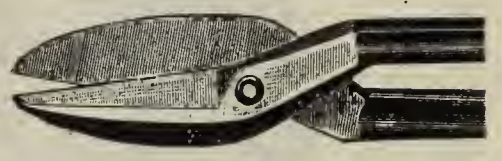
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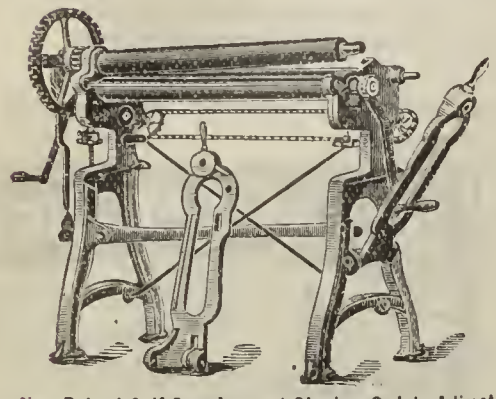
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Who would be glad to have you write for Estimates, etc.



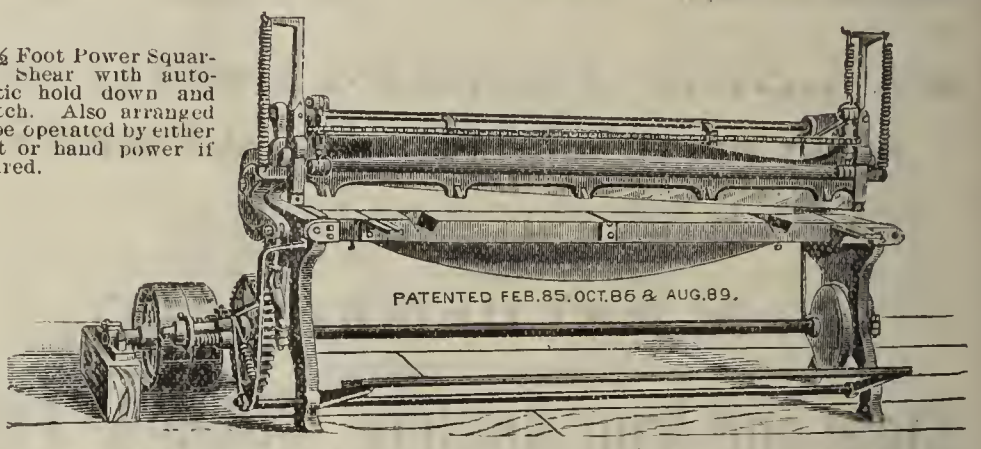
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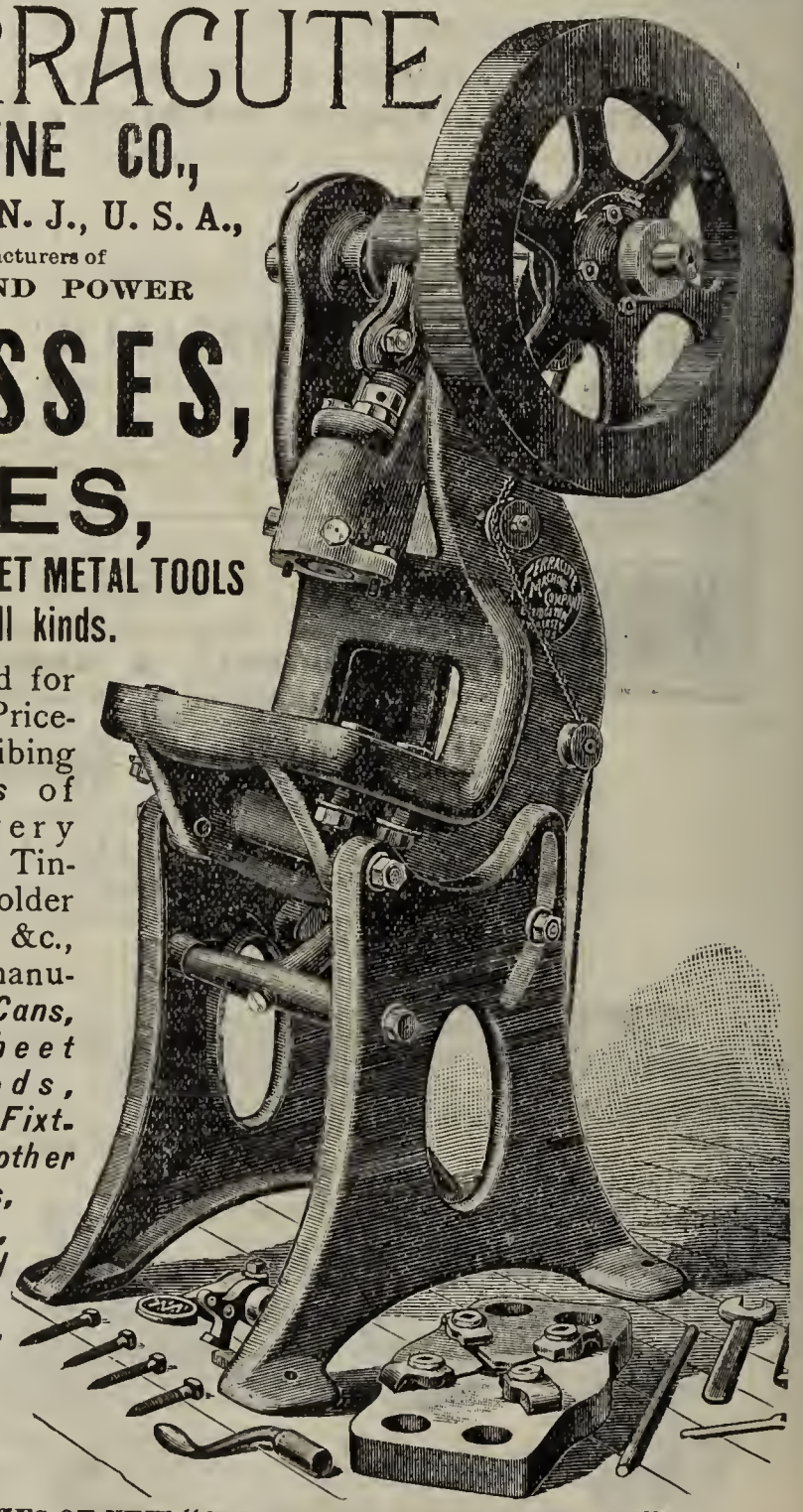
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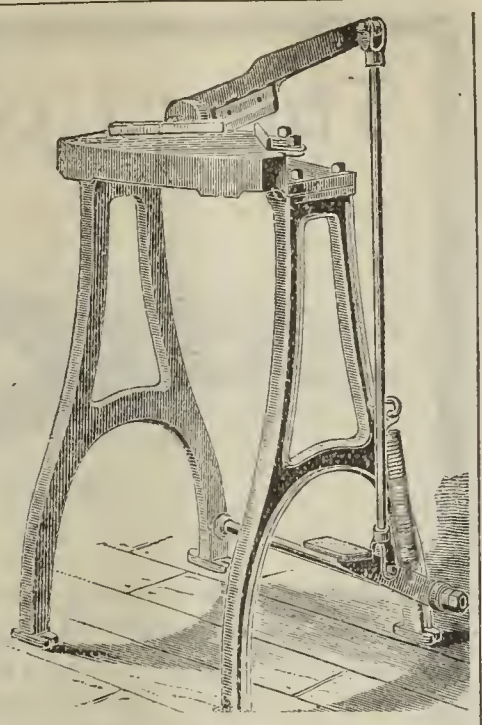
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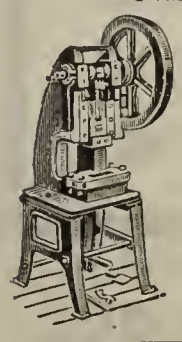
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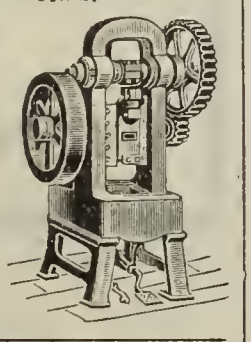
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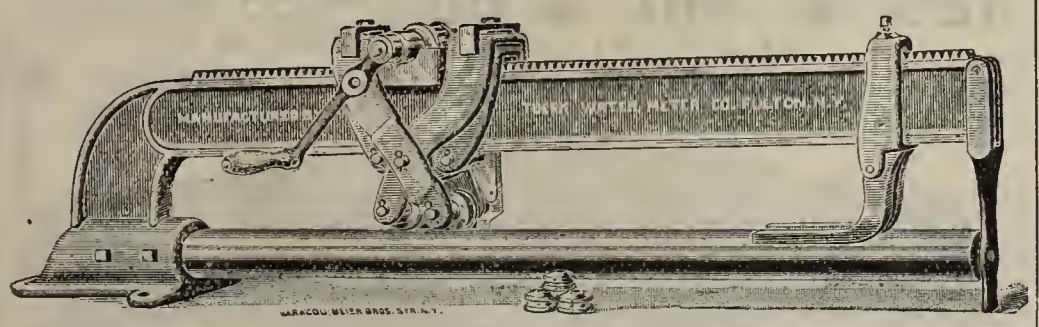
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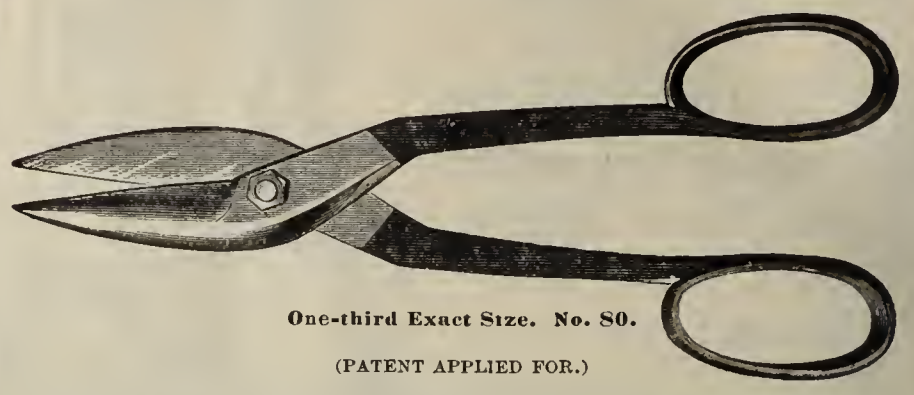
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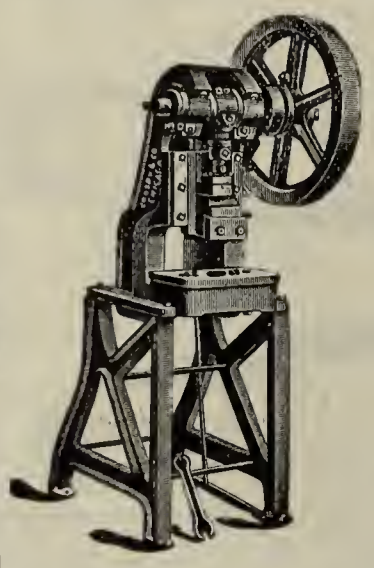
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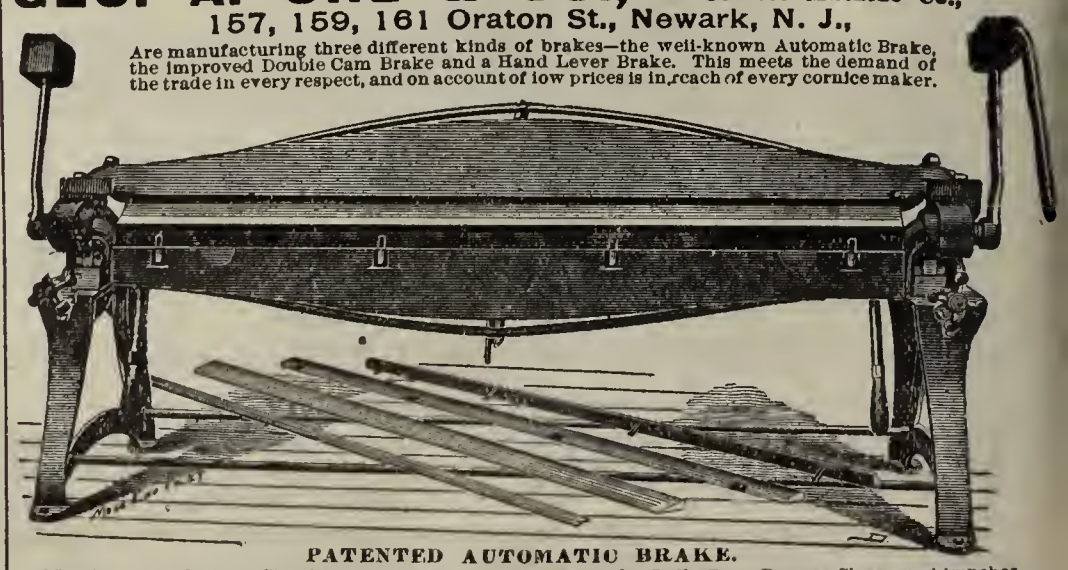
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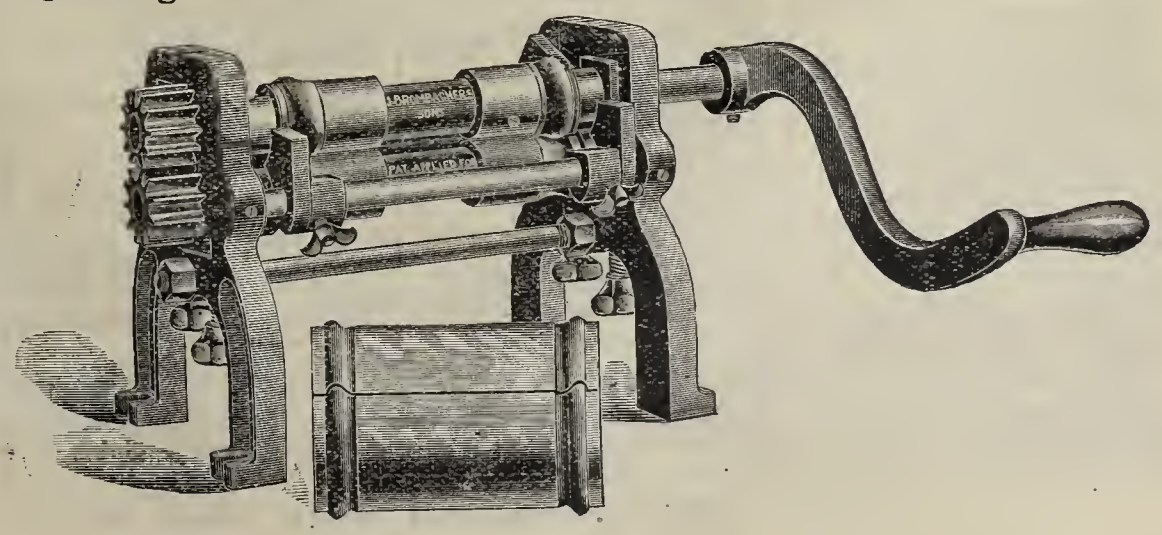
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Clark, Quien & Morse, Peoria, Ill.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Fostoria, Ohio.
Kanneberg Roofing Co , Cantou, Ohio.
Marlin & Co., Allegheny City, Pa.
Niles Mfg. Co., Niles, O.
Rhodes, Dickelman & Co., Forest, O.

Eave Trough Hangers.
Bell, John W. & Co., Mercer, Pa.
Berger Mfg. Co., Canton, O.
Clark, Quien & Morse, Peoria, Ill
Prondman Bros., Meriden, Conn.
Rhodes, Dickelman & Co., Forest, O.

Egg Beaters.
Lightning Dasher Egg Beater Co., Toledo, Ohio.

Elbows.
N. Y. Elbow Co., 18 Cliff St., N. Y.

Electric Dynamo Machines.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett Chemical Co., 8-14 Grand St., New York.

Elevators.
Morse, Williams & Co., Philadelphia, Pa

Enameled Ware.
Bellaire Stamping Co., Harvey, Ill.
St. Louis Stamping Co., St. Louis, Mo.

Faucets.
Clark Novelty Co., Rochester, N. Y.

Fire Brick.
Presbrey Stove Lining Co., Taunton, Mass.

Fire Sets.
Troy Nickel Works, Troy, N. Y.

Flour Bins and Sifter.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Foundry Facings, Supplies and Tools.
Obermayer, S. Co., Cincinnati, O.
Paxson, J. W. & Co., Philadelphia, Pa.
Rice Mfg. Co., New Durham, N. H.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

Furnace Pipe and Fittings.
Carton Furnace Co., Utica, N. Y.
Excelsior Steel Furnace Co., Chicago
Schaffer, Jno. P., Pittsburgh, Pa.

Furnaces and Heaters.
Barstow Stove Co., Providence, R. I.
Bibb, S. C. Stove Co., Baltimore, Md.
Carton Furnace Co., Utica, N. Y.
Corning Mfg. Co., Corning, N. Y.
Cory, Uzal & Co., 210 Water St., N. Y.
Fox Furnace Co., Cleveland, Ohio.
Front Rank Steel Furnace Co., St. Louis, Mo.
Fuller & Warren Co., Troy, N Y.
Giblin & Co., Utica, N. Y.
Graff & Co., 208 Water Street, N. Y.
Hart & Crouse, Utica, N. Y.
Hess. Snyder & Co., Massillon, Ohio.
Hood Furnace & Supply Co., Corning, N. Y,
Howard Furnace Co., Syracuse, N. Y.
Kelsey Furnace Co., Syracuse, N. Y.
Kernan Furnace Co., Utica, N. Y.
Michigan Stove Co., Chicago, Ill.
Pease, J. F, Furnace Co., Syracuse, N.Y.
Rapid Transit Stove & Furnace Co., Baltimore, Md.
Ridgway Furnace Co., Boston. Mass.
Schwab & Sercomb, Milwaukee, Wis.
Sheppard, Isaac A. & Co., Phila., Pa.
Stamford Foundry Co., Stamford, Conn.
Thatcher Furnace Co., 33 Peck Slip, N. Y.

Furnaces, Plumbers' and Tinners'.
Hull, M. L., Cleveland, O.

Galvanizing Kettles.
Sands, Thos., Nashua. N. H.

Gas Heaters—*See Stoves and Ranges' Gas.*

Gas Machines.
Cleveland Gas Machine Co., Cleveland, Ohio.
Kemp, C. M. Mfg. Co., Baltimore, Md.

Grain Measures.
Bellaire Stamping Co., Harvey, Ill.

Grates.
Jackson, W., Sons, 246 Front St., N. Y.

Granite Ware.
St. Louis Stamping Co., St. Louis, Mo.

Grooversi.
Tuerk Water Meter Co., Fulton, N. Y.

Hardware Specialties.
Philadelphia Hardware & Malleable Iron Works, Philadelphia, Pa.

Harness Snaps.
Covert Mfg. Co., W. Troy, N. Y.

Heaters, Steam and Hot-Water.
Barstow Stove Co. Providence, R. I.
Carton Furnace Co., Utica, N. Y.
Electric Boiler Co., Rochester, N. Y.
Fuller & Warren Co., Troy, N. Y.
Gorton & Lidgerwood Co., 96 Liberty St., N. Y.
Gurney Heater Mfg. Co., Boston, Mass.
Hart & Crouse, Utica, N. Y.
Howard Furnace Co., Syracuse, N. Y.
Mahony, M., Troy, N. Y.
Mowry W. C., Norwich, Conn.
New York Central Iron Works, Geneva, N. Y.
Page Boiler Co., Wm. H., Norwich, Conn.
Pease, J. F. Furnace Co., Syracuse, N.Y.
Putnam Foundry & Machine Co., Putnam Conn.
Raymond & Campbell Mfg. Co., Middletown, Pa.
Richmond Stove Co., Norwich, Conn.
Scollay, Jno. A., Brooklyn, N. Y.
Smith Co., H. B. 137 Centre St., N. Y.
Smith & Winchester Co., Boston, Mass
Springfield Coil Boiler Co., Springfield, Mass.
Vanderman, Wm., Willimantic, Conn.
Weathered, Thos. W. Sons, 244 Canal Street, New York.

Hollow Ware.
Bellaire Stamping Co., Harvey, Ill.
Bronson Supply Co., Cleveland, O.
Griswold Mfg. Co., Erie, Pa.
St. Louis Stamping Co., St. Louis, Mo.
Sperry, D. R. & Co., Batavia, Ill.

Hollow Ware, Aluminum.
Griswold Mfg. Co., Erie, Pa.
Wohler Alumiuum Co., Chicago, Ill.

Iron, Galvanized Sheet.
Cincinnati Corrugating Co., Piqua, O.
Coe, Jas. A. & Co., Newark, N. J.
Jersey City Galvanizing Co., 112 John St., N. Y.
McDaniel & Harvey Co., Philadelphia, Pa.
Merchant & Co., Inc., Philadelphia, Pa.
Merry & Clark, 535-547 West 15th St., New York.
Moorhead-McCleane Co., Pittsburgh, Pa.
Republic Iron Works, Pittsburgh, Pa.
Taylor, N. & G. Co., Philadelphia, Pa.
Wood, Alan Co., Philadelphia, Pa.

Iron, Galvanized.
Republic Iron Works, Pittsburgh, Pa.

Iron, Planished Sheet.
Wood, W. D. Co., McKeesport, Pa.

Iron and Steel, Sheet.
Ætna-Standard Iron & Steel Co., Bridgeport, O.
Cambridge Iron & Steel Co., Cambridge, O.
Cincinnati Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Lyon, Conklin & Co., Baltimore, Md.
McDaniel & Harvey Co., Philadelphi Pa.
Meurer Bros. Co., Brooklyn, N. Y.
Moorhead-McCleane Co., Pittsburgh, Pa.
Osborn, J. M. & L. A., Cleveland, O.
Republic Iron Works, Pittsburgh, Pa.
St. Louis Corrugating Co., St. Louis, Mo.
St. Louis Stamping Co., St. Louis, Mo.
Taylor, N. & G. Co., Philadelphia, Pa.
U. S. Iron & Tin Plate Mfg. Co., Demmler, Pa.
Wood, W. D. Co., McKeesport, Pa.
Wood Co., Alan, Philadelphia, Pa.

Iron Shutters and Doors.
Garry Iron & Steel Roofing Co., Cleveland, Ohio.

Ironware, Galvanized.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.

Iron & Wire Work, Ornamental.
Barnum, E. T., Detroit. Mich.

Lacquers and Japans.
Hanson & Van Winkle Co., Newark, N. J.

Lamp Stoves and Heaters.
Central Oilgas Stove Co., Boston, Mass
Glazier Stove Co., Chelsea, Mich.

Lead Pipe.
Colwell Lead Co., 63 Centre St., N. Y.

Manufacturers' Agents.
Rankin & Co., London, England.

Metal Ceilings.
Metal Stamping & Spinning Co., Grand Rapids, Mich.
N. Y. Metal Ceiling Co., 21st St. & 13th Ave., New York.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.

Metals.
Sanborn, J., 217 Water St., N. Y.

Metal Stamping and Spinning.
Lupton's, David Sons, Philadelphia, Pa

Mica.
Belden, F. E. Mica Mining Co., Boston, Mass.
Munsell, Eugene & Co., 218 Water St., N. Y.
Palermo Mica Co., 27 Peck Slip, N. Y.
Schoonmaker, A. O., 158 William St., New York.

Mica Canopies.
Mica Mfg. Co., 89 Fulton St., N. Y.

Molding Sand.
Obermayer, S. Co., Cincinnati, Ohio.
Smith, J. D., Foundry Supply Co., Cincinnati, Ohio.

Motors, Water.
Bolgiano Mfg. Co., Baltimore, Md.

Nickel Plating, &c.
N. Y. Nickel Plating and Mfg. Co., 227 and 229 West 29th St., N. Y.

Nickel Plating Outfits.
Eddy Electric Mfg. Co., Windsor, Conn.
Hanson & Van Winkle Co., Newark, N. J.
Zucker & Levett Chemical Co., 8-14 Graud Street, New York

Oil Cans.
Central Oilgas Stove Co., Boston, Mass.

Ollers.
Vogel, William & Bros., 37 to 47 South 9th St., Brooklyn, N. Y.

Ovens, Portable.
Blodgett, G. S. Co., Burlington, Vt.

Palm Oil.
Lambert, Stoughton & Cooper, Philadelphia, Pa.

Pant Stretchers.
Covert Mfg. Co., W. Troy, N. Y.

Patent Solicitors.
Howson & Howson, Philadelphia, Pa.
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Patterns.
Bascom, H. Clay, Troy, N. Y.
Caley, Edw. L., Philadelphia, Pa.
Cincinnati Pattern Wks., Cincinnati, Ohio.
Cope, Geo. W., Detroit, Mich.
Gobeille Pattern Co., Cleveland, Ohio.
McLaughlin, Jno. K., Phila., Pa.
Vedder Pattern Wks., Troy, N. Y.

Pig Iron.
Wister, L. & R. & Co., Philadelphia, Pa.

Pipe Crimpers.
Indianapolis Elbow Co., Indianspolis, Ind.

Pipe, Water and Gas.
Shusters Foundry, Philadelphia, Pa.
Millar, C. & Son, Utica, N. Y.

Plumbago.
Obermayer, S. Co., Cincinnati, O.
Smith, J. D. Foundry Supply Co., Cincinnati, O.

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Fairbaven Marble & Marbleized Slate Co., Fairhaven, Vt.

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Iwan Bros., Streator, Ill.

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Vogel, Wm. & Bros., 37 to 47 S. Brooklyn.

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Ferracute Machine Co., Bridgeton, N.J.
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Robinson, J. M. & Co., Cincinnati, O.
Stiles & Parker Press Co., Brooklyn, N. Y.
Toledo Machine & Tool Co., Toledo, O.

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Deming Co., Salem, O.
Douglas, W. & B., Middletown, Conn.
Myers, F. E. & Bro., Ashland, O.

Punching Machines.
Bertsch & Co., Cambridge City, Ind.
Crosby, G. A. & Co., Chicago, Ill.
Eckstein, Chas. G. & Co., 45 Vesey St., N. Y.
Robinson, J. M. & Co., Cincinnati, O.

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American Radiator Co., Chicago, Ill.
Gurney Heater Mfg. Co. Boston, Mass.
Smith, H. B. Co., 137 Centre St., N. Y.

Reflectors.
Frink, I. P., 551 Pearl Street, N. Y.

Registers.
Buffalo Register Works Buffalo. N. Y.
Fox, F. B. Register Mfg. Co., Cleveland, Ohio.
Highton, Wm. & Sons, Boston, Mass.
Philadelphia Hardware & Malleable Iron Works, Philadelphia, Pa.

Roasters and Bakers.
New York Elbow Co., 18 Cliff St., N. Y
Wise, J. & Son, Butler, O.

Roofing Cement and Paint.
Garry Iron & Steel Roofing Co., Cleveland, O.
Globe Ventilator Co., Troy, N. Y.
Root, Addison L., Palmyra, N. Y.

Roofing, Iron and Steel Corrugated and Plain.
Acme Roofing Co., Canton, O.
Allen's Cornice & Corrugating Works, Chicago, Ill.
American Roofing Co., Cincinnati, O.
Berger Mfg Co., Canton, O.
Bischoff, F. F. & Co., Chicago. Ill.
Bowers, Galpin & Co., Binghamton, N. Y.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Columbia Corrugating Mfg. Co., Niles, O
Columbia Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, Ohio.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Haldeman, N. A. & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Kansas City Metal Roofing and Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugating Co., St. Louis Mo.
Sanderson & Peckham, Detroit, Mich.
Souther, E. E. Iron Co., St, Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Dwight Slate Machine Co., Hartford, Conn.
Lyon, Conklin & Co., Baltimore, Md.
Pocock, O., Cincinnati, Ohio.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor, Pa.
Emack, J. D., Philadelphia, Pa.
Gait, John & Sons, 253 Broadway, N.Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.
Rising & Nelson, West Pawlet, Vt.

Sad Irons, Gas.
Bolgiano Mfg. Co., Baltimore, Md,

School of Instruction.
Correspondence School of Mechanics, Scrantou, Pa.

Sheet Metal Machinery.
Bertsch & Co., Cambridge City, Ind.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover. Del.
Ferracute Machine Co. Bridgeton, N.J.

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Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co.. Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Robinson, J. M. & Co., Cincinnati, O.
Stark Machine & Tool Co., Buffalo N. Y.
Stiles & Parker Press Co., Brooklyn N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.
Toledo Machine & Tool Co. Toledo, O.
Tuerk Water Meter Co., Fulton, N. Y.

Shingles and Tiles, Metallic.
Berger Mfg. Co., Canton, O.
Bischoff, F. F. & Co., Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Sanderson & Peckham, Detroit, Mich.
Thorn Shingle and Ornament Co. Philadelphia, Pa.
Van Noorden, E. & Co., Boston, Mass.

Shot.
Colwell Lead Co., 63 Centre St., N. Y.

Skylights.
Miller. J. A., & Bro., Chicago, Ill.
Rasner & Dinger, Pittsburgh, Pa.

Slater's Tools.
Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y,
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.
Halliday, M., East 9th St., N. Y.

Solder.
Bruce & Cook, 186 to 190 Water St., N. Y
Gummey, Spering & Co., Philadelphia, Pa.
Lang, E. M. & Co., Portland, Me.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N & G. Co., Philadelphia, P

Soldering Irons.
Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.
Ostrander, W. R. & Co., 204 Fulton St., N. Y.

Statuary, Sheet Metal.
Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.
Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Nason Mfg. Co., 71 Beekman St., N. Y.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.
Dixon, Jos. Crucible Co., Jersey City N. J.
Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.
Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.

Stove Patterns.
Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cincinnati Pattern Wks., Cincinnati, Ohio.
Cope, G. W., Detroit, Mich.
Gobielle Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.
Ruth, Patterson & Ruth, Alliance, O.

Stove Pipe Thimbles.
Bretch, A., Dayton, O.
Cheney, S. & Son., Manlius, N. Y.
Stearns, E. C. & Co., Syracuse, N. Y.

Stove Repairs.
Braner, A. G., St. Louis, Mo.
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Stove Trimmings, &c.
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Troy Nickel Works, Troy, N. Y.

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Eclipse Stove Co., Mansfield, Ohio.
Excelsior Mfg. Co., St. Louis, Mo.
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Graff & Co., 208 Water St., N. Y.
Joliet Stove Works, Joliet, Ill.
Kahn, F. & L. & Bros., Hamilton, Ohio.
Michigan Stove Co., Chicago, Ill.
Portland Stove F'dry Co., Portland, Me.
Portsmouth Stove & Range Co., Portsmouth, O.
Rapid Transit Stove & Furnace Co., Baltimore, Md.
Rathbone, Sard & Co , Albany, N. Y.
Raymond & Campbell Mfg. Co., Middletown, Pa.
Resor, Wm. & Co., Cincinnati, O.
Sheppard, Isaac A. & Co., Philadelphia, Pa.
Stamford Foundry Co., Stamford, Conn.
Taplin, Rice & Co., Akron, O.
Thatcher Furnace Co., 33 Peck Slip, N. Y.
Van, John, Range Co., Cincinnati, O.
Western Stove Mfg. Co., St. Louis, Mo.

Stoves and Ranges, Gas.
Central Oilgas Stove Co., Boston, Mass.
Chicago & Erie Stove Co., Erie, Pa.
Clark, Geo. M. & Co., Chicago, Ill
Glazier Stove Co., Chelsea, Mich.

Stoves and Ranges, Oil, Vapor and Gasoline.
Barstow Stove Co., Providence, R. I.
Central Oilgas Stove Co., Boston, Mass
Clark, Geo. M. & Co., Chicago, Ill.
Glazier Stove Co., Chelsea, Mich.
Luther & Lederhos, 30 Cliff St., N. Y. City.
Troy Oil Stove Co., Troy, N. Y.

Strainers, Tea and Coffee.
Ideal Strainer Co., Boston, Mass.

Tea Kettles.
American Stamping Co., 103 to 119 No 3d St., Brooklyn, N. Y.
Central Stamping Co., 23 to 25 Cliff St., N. Y.

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Tinplate Decorating Co., 110 John St., N. Y.

Tin Plate and Tinners' Stock.
Bruce & Cook, 186 to 190 Water St. N. Y.
Calvert, P. B. & Co., Philadelphia, Pa.
Cleveland Tin Plate Co., Cleveland, O.
Coe, Jas. A. & Co., Newark, N. J.
Dunlap, John Co., Pittsburgh, Pa.
Gummey, Spering & Co., Phila., Pa.
Laufman Tin Plate Co., Pittsburgh, Pa
Lawson, F. H. & Co., Cincinnati, O.
Lyon, Conklin & Co., Baltimore, Md.
Merchant & Co., Inc., Philadelphia, Pa.
Merry & Clark, 535 to 547 W. 15th St. N. Y.
Meurer Bros. Co., Brooklyn, N. Y.
Moorhead-McCleane Co., Pittsburgh, Pa.
New Castle Steel & Tin Plate Co., New Castle, Pa.
Osborn, J . M. & L. A., Cleveland, Ohio.
Sanderson & Peckham, Detroit, Mich.
Taylor, N. & G. Co., Philadelphia, Pa.
U. S. Iron & Tin Plate Mfg. Co., Demmler, Pa.

Tinning Process.
Sands, Thomas, Nashua, N. H.

Tinware.
American Stamping Co., 103 to 119 N. 3d St., Brooklyn, N. Y.
Central Stamping Co., 23 and 25 Cliff St., N. Y.
Geuder & Paeschke Mfg. Co., Milwaukee, Wis.
Kleckhefer Bros. & Co., Milwaukee, Wis.

Tools and Machines, Steam and Gas Fitters'.
Armstrong Mfg. Co., Bridgeport, Conn
Curtis & Curtis, Bridgeport, Conn.
Pancoast, Henry B. & Co., Philadelphia, Pa.
Saunders', D. Sons, Yonkers, N. Y.
Trimont Mfg. Co., Roxbury, Mass.
Wells Bros. & Co., Greenfield, Mass.

Tools, Machines and Supplies Tinners'.
Berger, L. D., Philadelphia, Pa.
Berger Bros., Philadelphia, Pa.
Bertsch & Co., Cambridge City, Ind
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Bruce & Cook, 186 to 190 Water St., N. Y.
Covert Mfg. Co., W. Troy, N. Y.
Crosby, G. A. & Co., Chicago, Ill.
Dover Machine Works, Dover, Del.
Ferracute Machine Co., Bridgeton, N. J.
Keene, Geo. C. & Co., Cincinnati, O.
Lawson, F. H. & Co., Cincinnati, O.
Niagara Stamping & Tool Co., Buffalo.
Ohl, George A. & Co., Newark, N. J.
Peck, Stow & Wilcox Co., 27 Chambers St., New York.
Peerless Cooker Co., Buffalo, N. Y.
Ridgway & Wilkinson, Boston, Mass.
Ruth, Patterson & Ruth, Alliance, O.
Stark Machine & Tool Co., Buffalo, N.Y.
Stiles & Parker Press Co., Brooklyn, N. Y.
Tinners' Machinery & Supply Co., 9 Cliff St., N. Y.

Traps and Vents.
Bower, B. P. & Co., Cleveland, O.
Shuster's Foundry, Philadelphia, Pa.

Valves.
Jenkins Bros., 71 John St., N. Y
Mason Regulator Co., Boston, Mass.

Valve Wheels.
Greene, W. F., Troy, N. Y.

Ventilators and Chimney Caps.
Globe Ventilator Co., Troy, N. Y.
Iwan Bros., Streator, Ill.
Merchant & Co., Inc., Philadelphia, Pa.

Washers, Valves, &c.
Littleford Bros., Cincinnati, Ohio.
Marston, I. G. & Co., Boston, Mass.
Souther, E. E. Iron Co., St. Louis, Mo.

Washing Machines.
Boss Washing Machine Co., Clp., Chic.
Wayne, Anthony Mfg. Co., Fort Wayne, Ind.

Water Closets.
Colwell Lead Co., 63 Centre St., N. Y.
Dalton-Ingersoll Co., Boston, Mass.
Kelly, Thos. & Bros , Chicago, Ill.
Peck Bros. & Co., New Haven, Conn.

Water Coolers.
Central Stamping Co.
Shepard, Sidney & Co., Buffalo, N. Y.

Water Heaters.
Day Mfg. Co., Detroit, Mich.
Instantaneous Water Heating Co., Chicago, Ill.
Kemp, G. M. Mfg. Co., Baltimore, Md.

Well Covers.
Menefee & DeVilbiss, Fort Wayne, Ind.

Wire and Iron Work, Ornamental.
Barnum, E. T., Detroit, Mich.

Wrenches.
Trimont Mfg. Co., Roxbury Mass.

Zinc Sheets, Nickel Plated.
Parlser, B., 629 Broadway, N. Y.

Zinc, Spelter.
Illinois Zinc Co., Peru, Ill.

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THE METAL WORKER.

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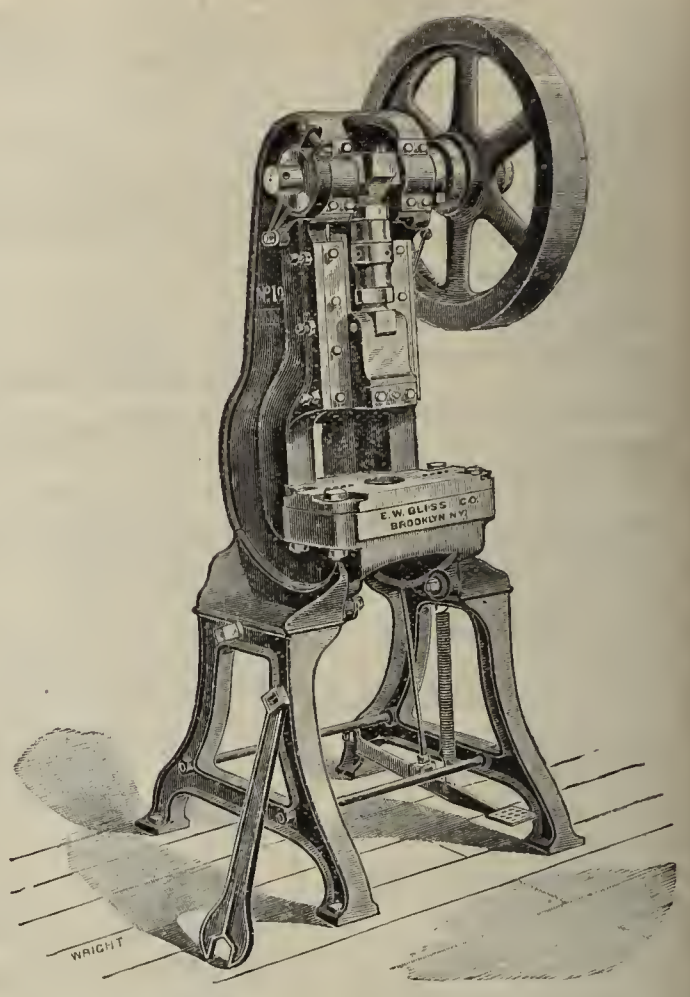
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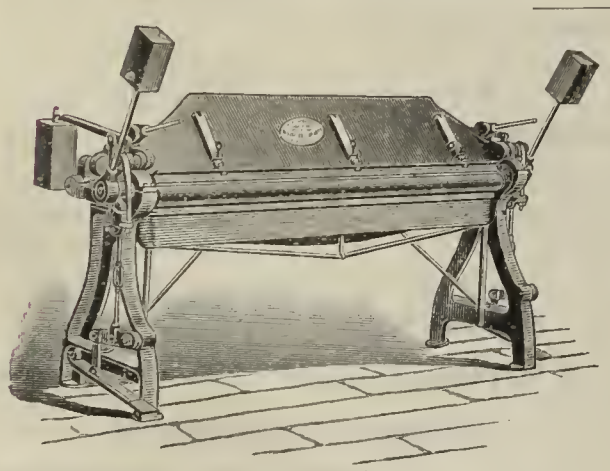


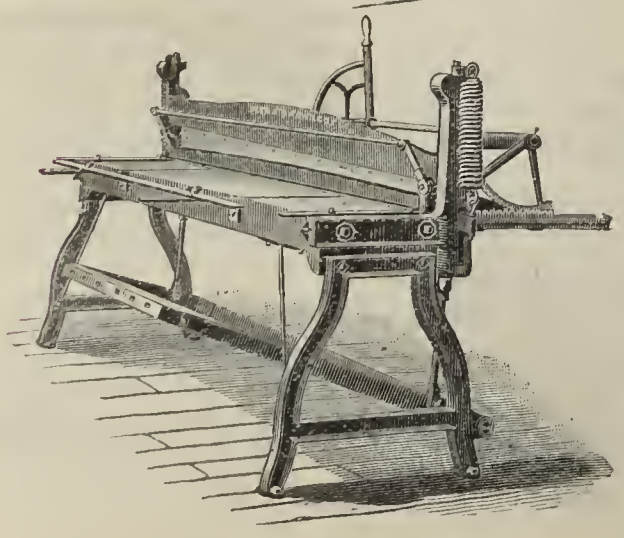
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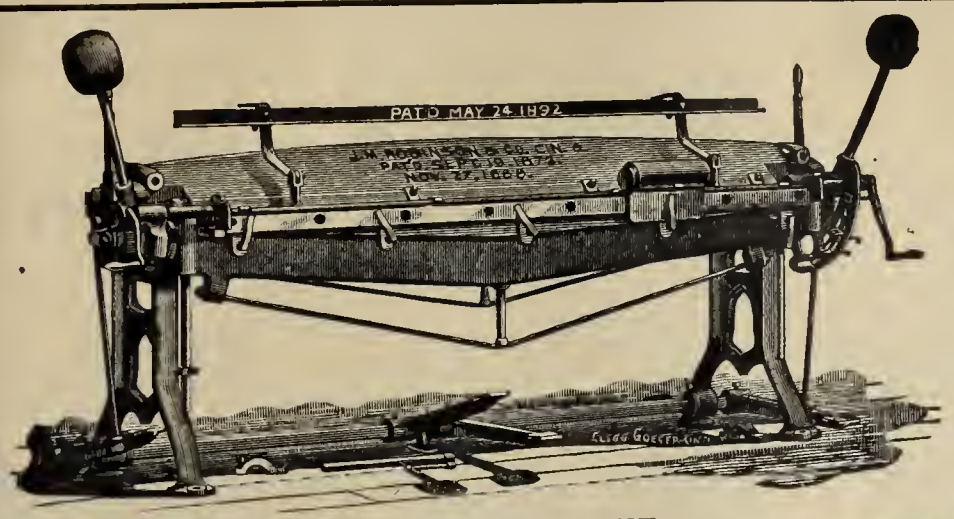
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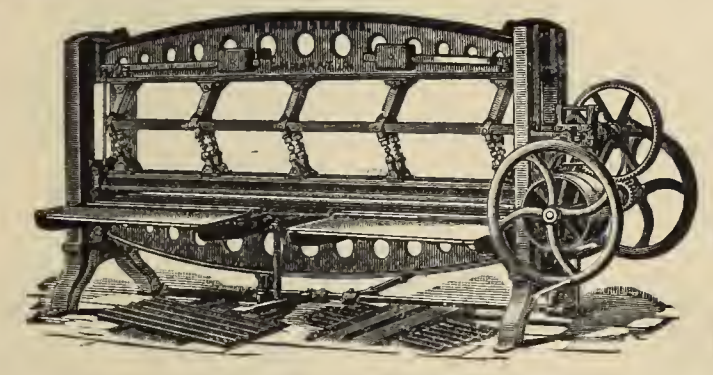
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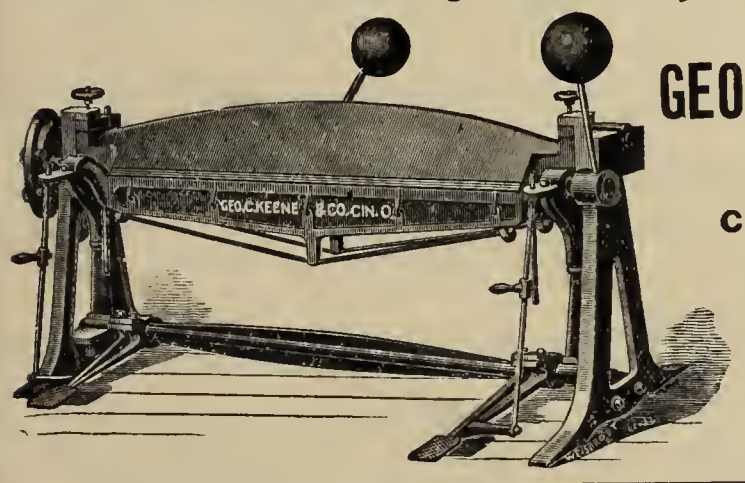


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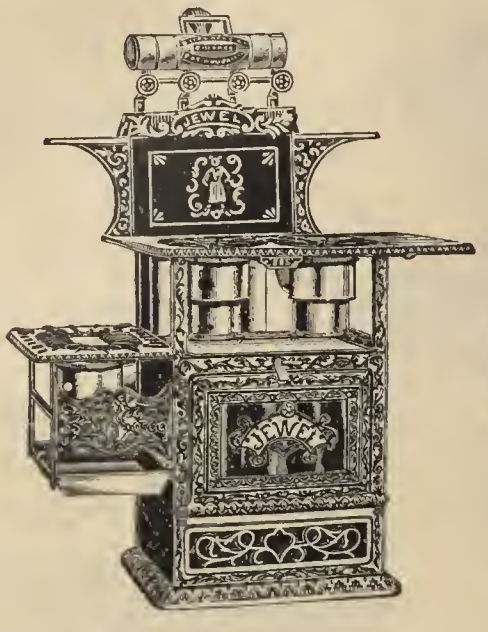
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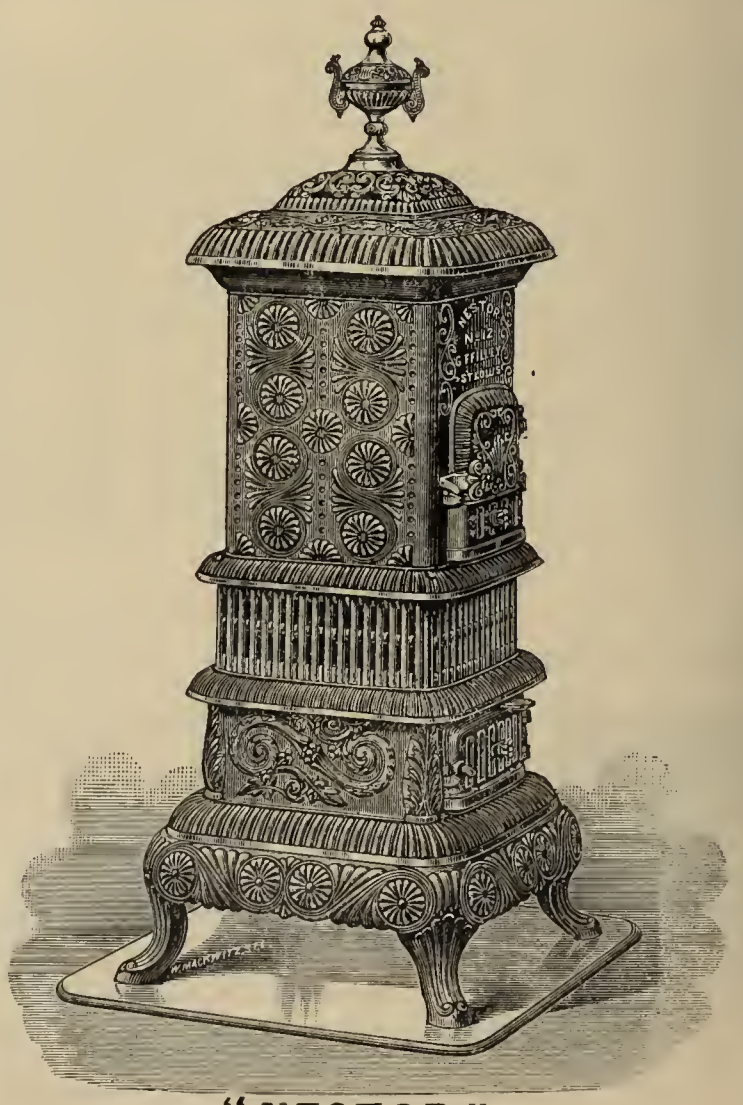
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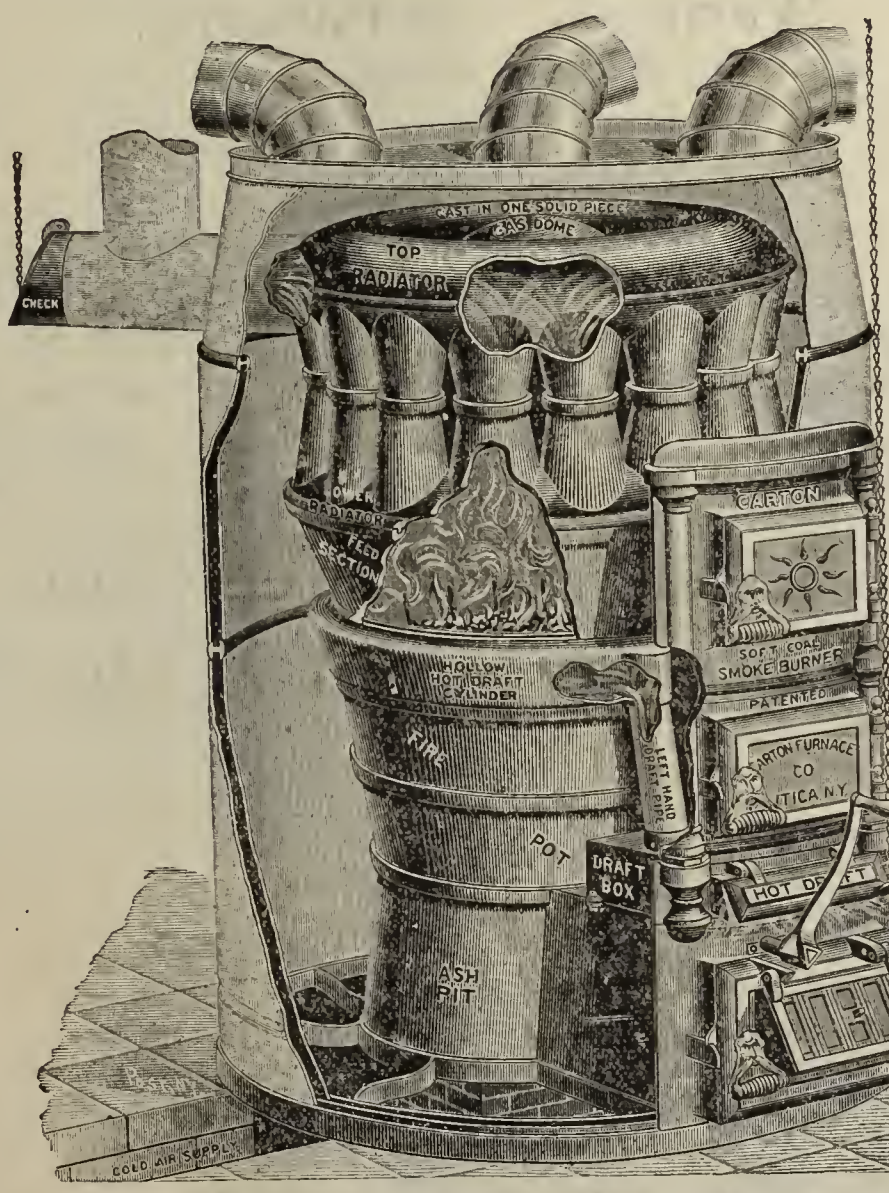
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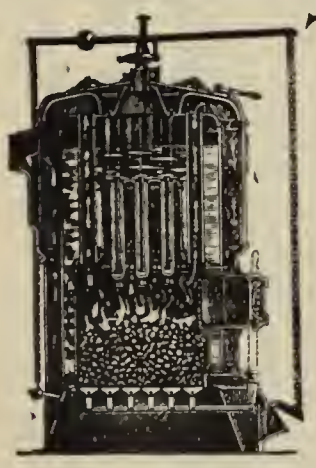
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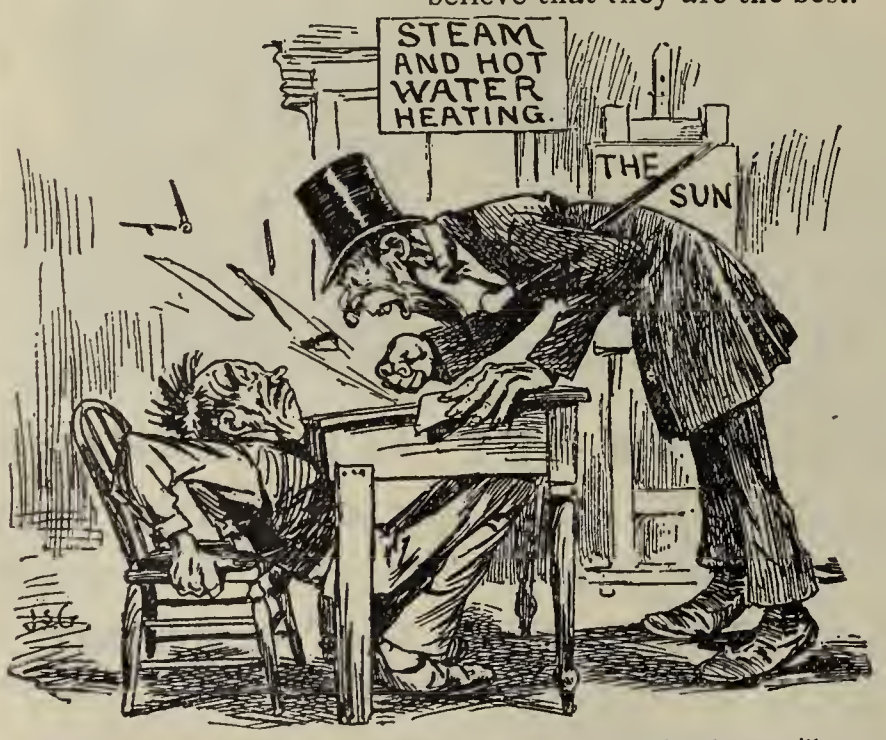
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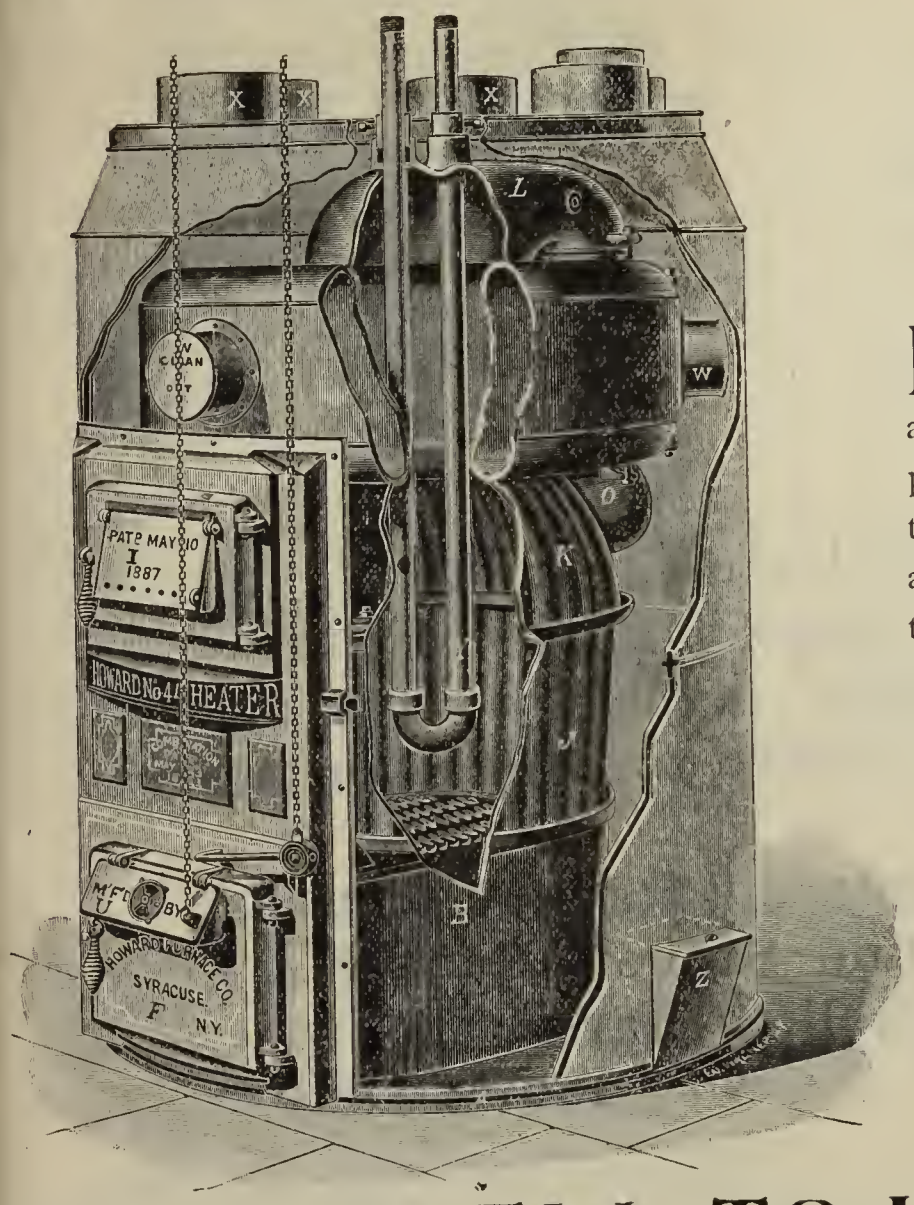


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Is suspended in and over centre of fire, and occupies a position remote from the sides of fire pot utilizing a percentage of available heat, without any deteriorating effect upon the warm air system.

HOWARD FURNACE CO.

MAIN OFFICE AND WORKS, SYRACUSE, N. Y.

SOLD AT

NEW YORK, 210 Water St.

BOSTON, 61 & 63 Blackstone St.

GRAND RAPIDS, 38 S. Division St.

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It would require more pages than this journal contains to illustrate and describe the new goods shown in our 1894 catalogue.

We offer better inducements to the trade than any other manufacturers, and can prove it to any buyer who will take time to investigate.

We have advantages that save thousands of dollars yearly in the cost of manuture.

We have increased our capacity every year for five consecutive years.

Our plant is the most complete of the kind in existence.

Our new catalogue illustrating and describing the largest modern line of stoves and ranges made by any one concern is now ready to mail upon application.

The Favorite Stove and Range Company,
Makers of fine Stoves, Ranges,
and Hollow-ware.

Branches:
St. Paul, Minn.
Kansas City, Mo.

Piqua, Ohio.

The rapid growth of our business is the strongest evidence of the superiority of our goods.

There are sixteen departments in the manufacture of our goods that have efficient foremen.



We guarantee the castings, mounting, nickel work, and all the workmanship in our goods to be unexcelled in every particular by any Stove Works in the World.

Eclipse Stove Co.,

MANSFIELD, O.

H. E. COOK, Mgr.; St. Anthony Park, Minn.

FOR

Minn., No. and So. Dakota.

Every Stove

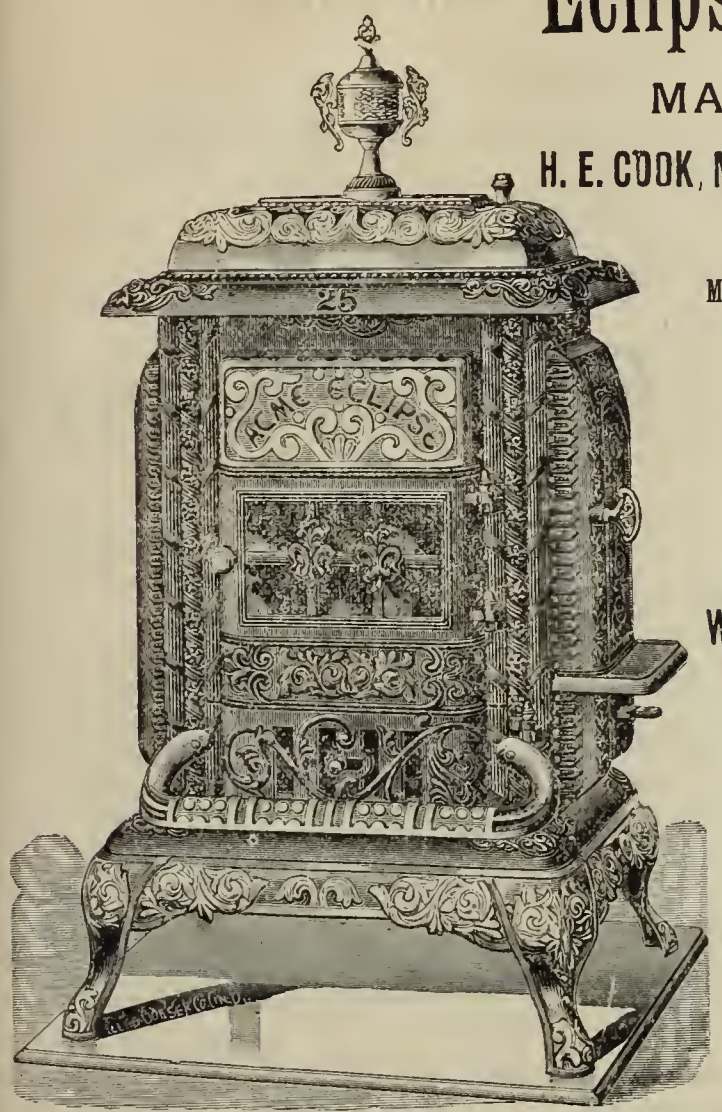
Warranted.

Write for Catalogue and Discounts.

QUALITY

In Every Respect

Strictly First Class.



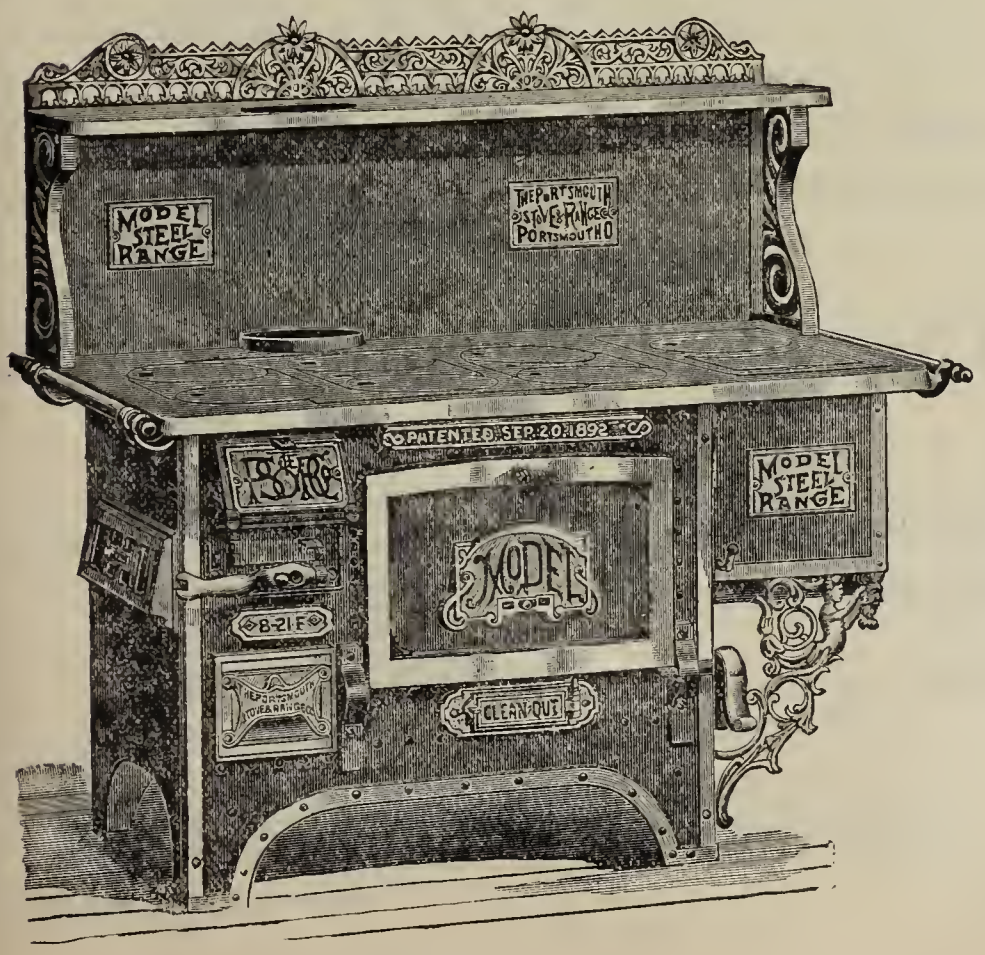
ACME ECLIPSE. Two Sizes, 23 in. nnd 25 in. Direct Draft Wood Heater.



PERFECT ECLIPSE OAK. Four Sizes. Coal or Wood.

The "Model"

With Flush-Top Reservoir.



WITH OUR VALUABLE ADDITION, THE

Rolling Damper,

which may be removed at will and permits entire freedom of draft. No rods, bolts or other parts in the way, to become loose or get out of order; something all have been striving for and the dealer has demanded. It's the simplest and best of 'em all. The Model Ranges are the only productions of the kind embodying this and numerous other excellent features. Address for full particulars

The Portsmouth Stove and Range Company,

—MAKERS—

PORTSMOUTH, OHIO.

AGENTS:

R. ROBINSON & SONS, Chicago, for the Northwest.

A. L. CANFIELD, 284 Pearl St., N. Y., for New England States.

C. F. HAKE & SONS, for Cincinnati and Vicinity.



Do you want to command

THE SALE OF AN ESTABLISHED LEADER WHICH STANDS WITHOUT A RIVAL IN THE LINE OF ROUND OAKS? . . .

Secure the Agency of the

Three Sizes: Nos. 14, 16, 18, Single or Double Sectional Fire Pot.

Round Climax

—OF—

TAPLIN, RICE & CO.,

AKRON, OHIO.

Among the Special

Constructive features of the Round Climax are a jointless ash pit, fitted with hinged draft valve in ash pit door, which can be regulated by a thumb screw to make an almost absolute **AIR TIGHT ASH PIT.** Has large ash pan, draw center shaking grate (manipulated fro n the outside), and is handsomely trimmed with nickel.

With **one bucket of soft coal** weighing 26 pounds fire has been retained **sixty-nine hours** in the No. 16 Round Climax.

Ferrosteel and Success.

A GREAT COMBINATION

Customers are writing us as follows :

"You have a very desirable Range in the Ferrosteel. The Oven, Fire Box and Ash Pan are perfect, and I expect to have a large trade in this line of Ranges."

"The Ferrosteel Range is received, and is all you claim for it."

"I have sold the Ferrosteel Range and it is all right. Enclosed is order for more, and shall sell quite a number this fall. It is a very taking Range."

Of course Ferrosteel Ranges are a success, because Ferrosteel Metal has no equal for stove construction. Ferrosteel Ranges right in working qualities and taking in appearance. The Ferrosteel Factory is situated so that we can secure best freight rates to any point in the United States.

Inquiries Cheerfully Answered.

The Dippo Manufacturing Co.. Cleveland and Chagrin Falls, Ohio.



The Ideal Atlantic Range

A NEW MEDIUM PRICED RANGE.

DESIGNED for a leader to sell in the same class with highest grade goods, but at a lower price.

One Extra Attachment is so novel and fit
That every customer buys and applauds it.

Inquire what it is and get prices.

Portland Stove Foundry Co.,

PORTLAND, MAINE.

Read these facts about "ESTATE OAKS." If wise, you will secure these magnificent stoves.



AUGUST SCHMITT,
Wholesale and Retail Dealer in
Stoves, Ranges Mantels, Pumps and Tinware,
EVANSVILLE, IND.

EVANSVILLE, IND., June 14th, 1894.

Messrs. F. & L. KAHN & BROS., Manufacturers, Hamilton, Ohio.

Gentlemen: In answer to your inquiry concerning the experience I have had with the ESTATE OAK, I can say that I am very well pleased with the success I have had in handling them. All reports coming in from parties using them have been favorable Where a stove was sold it always would help sell more in that neighborhood. Its Seamless Ash Pit, Doors with Screw Registers and fine Appearance, Heating and Fire Holding Qualities are the Points with which it recommends itself to the customers. Do not know of any stove in that line which I consider its equal.

As to my dealings with you, I can say that they have been satisfactory in every respect, which surely has been proven by order already placed with you for next season.

The special advantage in the ESTATE OAK is, it is not an imitation of some other stove, as we find in a great many other stoves which the market is flooded with.

Hoping that we have a good season before us, and that our dealings with each other will continue satisfactory as heretofore, I remain

Yours truly,
AUGUST SCHMITT.

STATE OF OHIO, }
COUNTY OF BUTLER. }

Personally appeared before me, a Notary Public, in and for said County and State, Jacob Martin, known to me and who deposeth and saith:

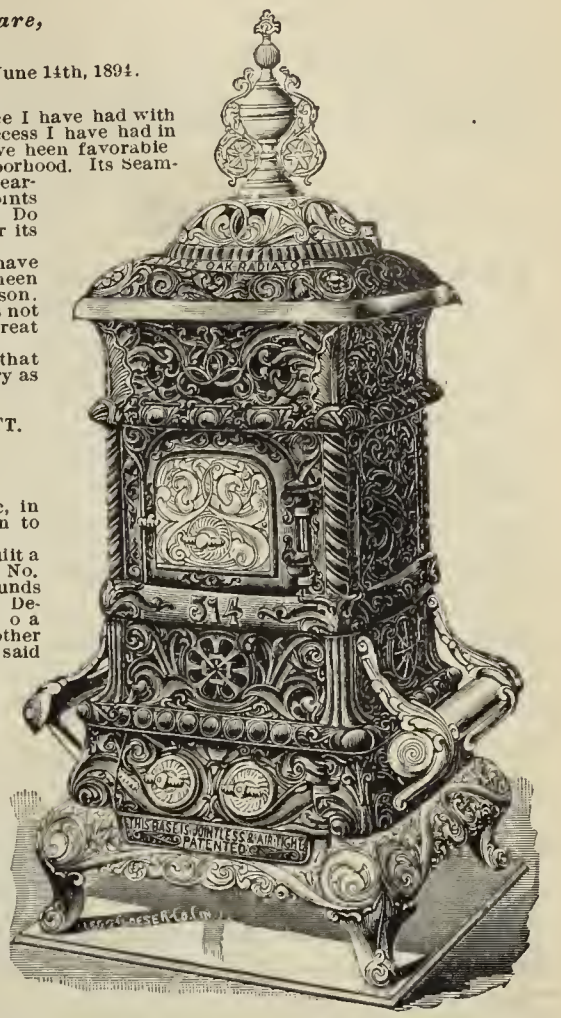
That on Saturday, June 2d, 1894, at 9.40 A. M., he built a fire in a heating stove marked "Estate Oak Radiator No. 514;" that he then weighed and charged fifty (50) pounds of anthracite or hard coal (nut size) into said stove Deponent further saith, that said stove was connecte o a first class flue of about fifty (50) feet, and that no other person but himself had access to said stove during said trial test.

Deponent further saith, that the said fuel continued to burn in and keep said stove hot and that fire was visible therein, beginning on said Saturday, June 2d at 9.40 A. M. until 10.40 o'clock A M of Tuesday, June 5th, 1894, or that in other words, fire and heat were maintained therein continuously for a period of seventy-three (73) hours.

Deponent further saith, that ten (10) pounds of the coal originally charged were sifted out of the residue and that only forty (40) pounds were actually consumed during the test and that there were no clinkers in said residue.

JACOB MARTIN.

Sworn to and subscribed before me this 11th day of June A.D. 1894.
ABRAHAM BALLINGER,
Notary Public.



F. & L. Kahn & Bros., Manufacturers, Hamilton, Ohio.

Why Is It?



THAT boards of education, church trustees and owners of buildings whom we know are successful business men, not one of whom buys an article out of sentiment, all demand "The Favorite," Why? The reason is obvious enough. A poor production won't sell at any price, hence it ***must be merit*** that makes our sales of this furnace the largest of any concern in the West. If you can sell a furnace or know of any place where one is needed write us, we'll make it worth your while.

The Bennett & Peck Heating & Vent'g Co.,
Cincinnati, O.

Ventilation and Heating.

By JOHN S. BILLINGS, A.M., M.D.

PRICE, $6.00.

Over 500 pp.—210 Illustrations. Cloth.

FROM THE PREFACE.

IN preparing this volume my object has been to produce a book which will not only be useful to students of architecture and engineering, and be convenient for reference by those engaged in the practice of these professions, but which can also be understood by non-professional men who may be interested in the important subjects of which it treats, and hence technical expressions have been avoided as much as possible, and only the simplest formulæ have been employed. It includes all that is practically important of my book on the Principles of Ventilation and Heating, the last edition of which appeared in 1889; but it is substantially a new work, with numerous illustrations of recent practice.

TABLE OF CONTENTS:

Introduction.—Utility of Ventilation.
History and Literature of Ventilation.
The Atmosphere: Its Chemical and Physical Properties.
Carbonic Acid.
Conditions Which Make Ventilation Desirable or Necessary. Physiology of Respiration. Gaseous and Particulate Impurities of Air. Sewer Air. Soil Air. Dangerous Gases and Dusts in Particular. Occupations or Processes of Manufacture. Drying Rooms.
On Moisture in Air, and Its Relation to Ventilation.
Quantity of Air Required for Ventilation.
On the Forces Concerned in Ventilation.
Examination and Testing of Ventilation.
Methods of Heating. Stoves. Furnaces. Fireplaces. Steam and Hot Water. Thermostats.
Sources of Air Supply. Filtration of Air. Fresh-Air Flues and Inlets. By-passes.
Foul-Air or Upcast Shafts. Cowls. Syphons.
Ventilation of Mines.
Ventilation of Hospitals and Barracks. Barrack Hospitals. Hospitals for Contagious Diseases. Blegdams Hospital. U. S. Army Hospitals. Cambridge Hospital. Hazleton Hospital. Barnes Hospital. New York Hospital. Johns Hopkins Hospital. Hamburg Hospital. Insane Asylums. Barracks.
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DAVID WILLIAMS, Publisher and Bookseller,

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This range was advertised last year with triangular grate. Now it has triangular, duplex, or flat. All that is needed to change from one style to either of the others is a new number-plate. No changing of bricks or grate frame, nor even taking them out.

Let us send you a full description.

THE STAMFORD FOUNDRY COMPANY,

STAMFORD, CONN.



Beware of Infringing Stoves.

Parties dealing in oil stoves would do well to compare the hinge on this stove that the body swings on with others that may be offered them, as we are the patentees of said hinge, and shall protect ourselves against all parties infringing.

TROY OIL STOVE CO.,

TROY, N. Y.



THE

Scollay Hot Water Heater

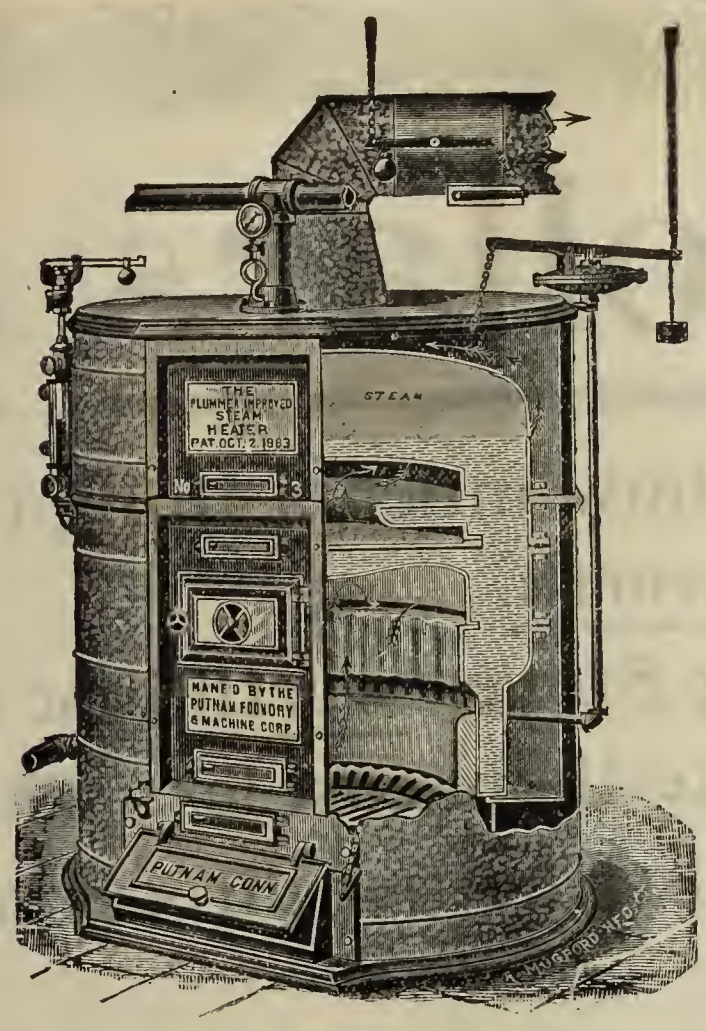
For Warming Dwellings, Stores, Offices, Churches, Public Buildings, &c.

Also Boilers specially constructed for Greenhouses, Conservatories, Baths, Laundries, &c.

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The Plummer Steam Heater

AND THE

Leader Hot Water Heater,

IMPROVED FOR SEASON OF 1894-5.

NO UNNECESSARY CROOKS AND TURNS,
NO EXPENSIVE ORNAMENTATION.

Constructed as simply as an efficient apparatus can be.

NO WASTE. NO SHIRKING.

As *TRIED* and *TRUE* as

"OLD PUT." himself.

If you are not perfectly satisfied with the boiler you are handling, send postal for our catalogue.

PUTNAM FOUNDRY & MACHINE CO.,

PUTNAM, CONN.

A CONTINUAL PROCESSION OF

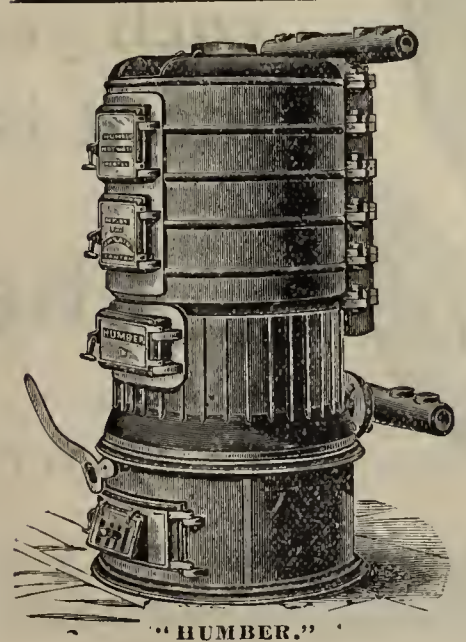


PARAGON. FIDELITY. PARAGON. FIDELITY. PARAGON.

PARAGON FURNACES and FIDELITY RANGES

Is moving steadily from our works to the homes of delighted purchasers, by way of the stores of enterprising dealers, who have found profit in aiding the course of the procession. You can get into line if you will.

Isaac A. Sheppard & Co., Manufacturers, 1801 N. Fourth St., Philadelphia, Pa.



"HUMBER."

"CANTON HEATERS"

CANTON HEATERS

TRADE MARK.

FOR

HOT WATER, STEAM AND HOT AIR.

Humber, Hartford, Yale, Sandow.
Cambridge, Tubular.
Oxford Perfect Blast.

Plenty of Sizes. For all Kinds of Fuel. A good line to handle.

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We are making Stoves worth just as
If we could make them cost less witho
Our efforts are in another direction.
worth more.

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It's bett
pay little
A trial
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mark in w
The fact
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merit is a

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DETROIT,

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"The World's Best"

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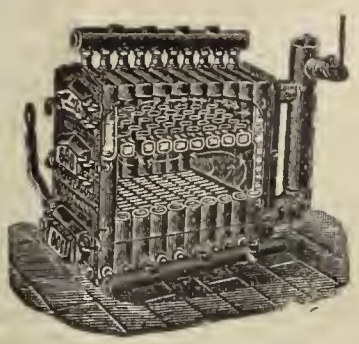
chigan Stove Company,

rgest Makers of Stoves and Ranges in the World.

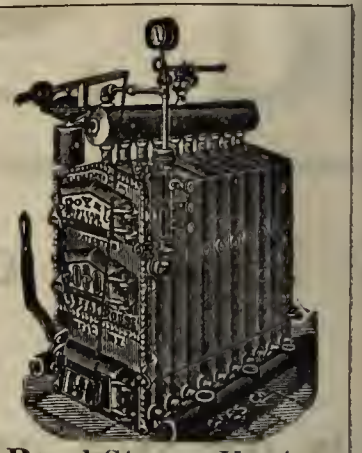
HICAGO, BUFFALO, NEW YORK CITY.

Sold on their Merits,

and not on their Antiquity.



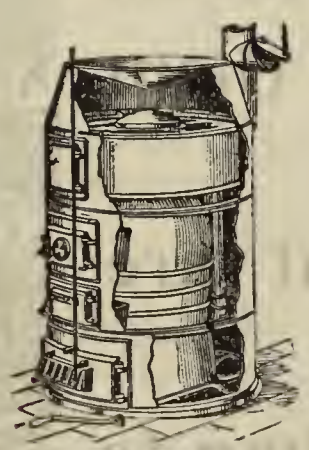
Royal Hot Water Heater.



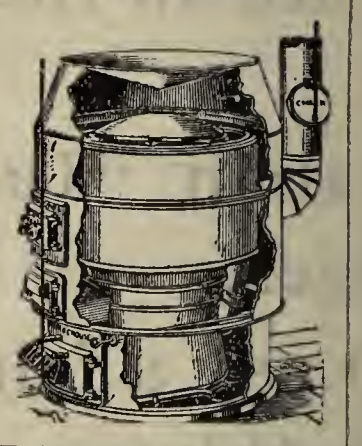
Royal Steam Heater.



Imperial Hot Air Furnace.

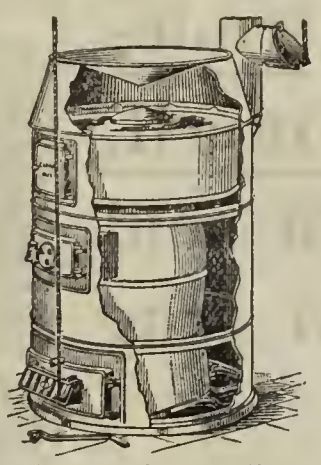


Royal Hot Air Furnace.

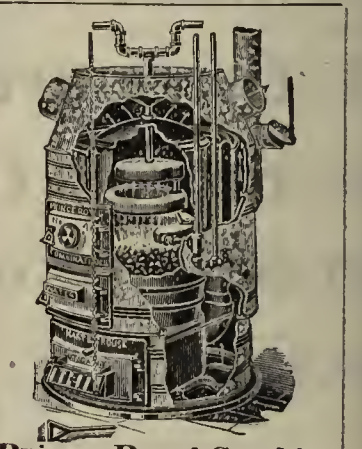


Prince Royal Hot Air Furnace.

ROYAL HEATERS



Royal Victor Hot Air Furnace.



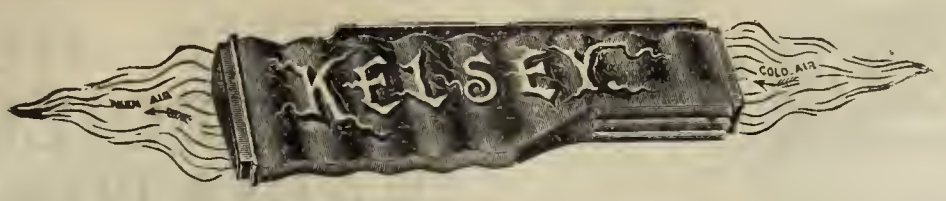
Prince Royal Combination Heater.

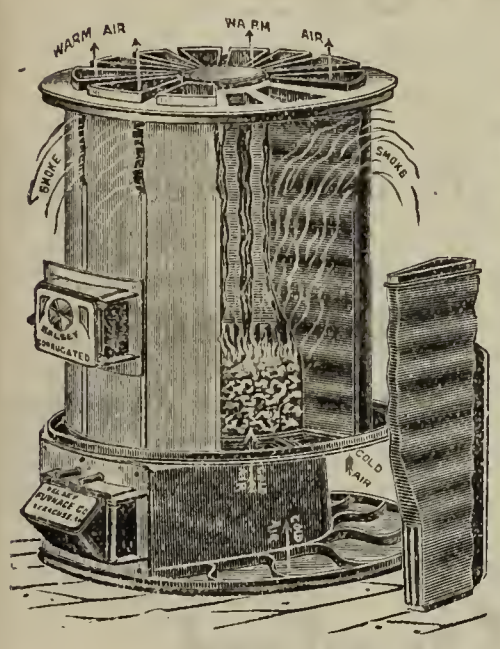
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No. 1 Cornelia Street, UTICA, N. Y.

CHICAGO, 79 LAKE STREET.

W. M. MACKAY, Manager Hot Water and Steam Dept., No. 211 Water St., New York.

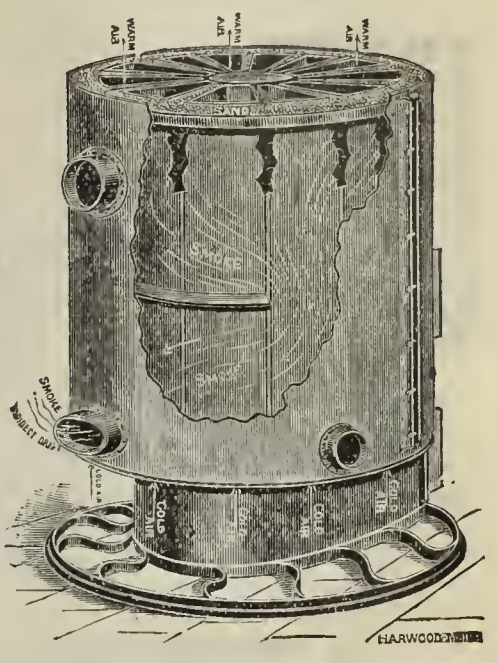




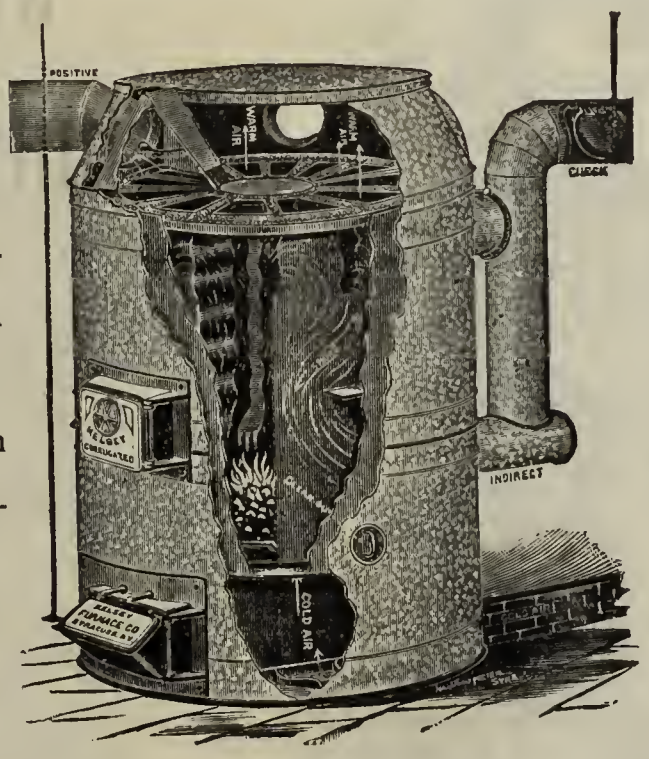
WARM AIR FURNACES.

These three cuts show the entire construction and workings of

The Most Powerful Heaters ever Built.



By actual measurement over double the heating surface in direct contact with the fuel in combustion than has any other Furnace on the market, with corresponding size grate surface.



LOW DOWN.
GAS TIGHT.
LONG INDIRECT DRAFT.
POSITIVE CIRCULATION OF HOT AIR TO ANY ROOM MOST DIFFICULT TO HEAT.

ZIEGLER BROTHERS,
General Hardware, Stoves, Furnaces, Ranges, 45 Chicago Street.

ELGIN, ILL., May 26, 1894

KELSEY FURNACE CO., Syracuse, N. Y.

GENTLEMEN.—Yours of the 24th inst. at hand, and we are pleased to write you a line about your Furnaces. You can judge best, however, by the orders we sent you, how we and our customers like your Furnaces. You will notice by your books that we bought of you either 29 or 30 Kelsey Furnaces from Feb., 1893, to Jan. 1, 1894. Every Furnace is sold and giving perfect satisfaction, without an exception. As for us, we have sold many of the Standard make of Furnaces, but never sold a Warm Air Furnace, or anything else, that has interested us more than the Kelsey Furnace, or proved a more perfect success. We not only had a fine sale with them last year, but made friends with all who bought them. We really cannot express the satisfaction there is in having the Kelsey Corrugated Furnace, as compared with any of the others we have sold. Wishing you deserved success, we remain, yours truly,

ZIEGLER BROS.

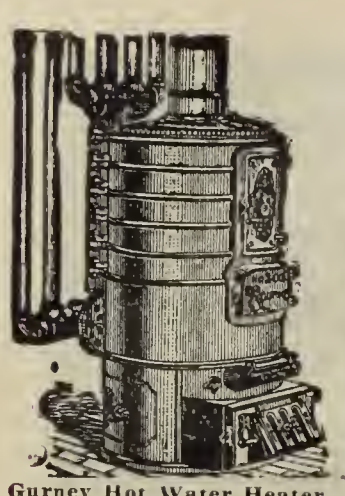
KELSEY FURNACE COMPANY,

339 WEST FAYETTE STREET, SYRACUSE, N. Y.

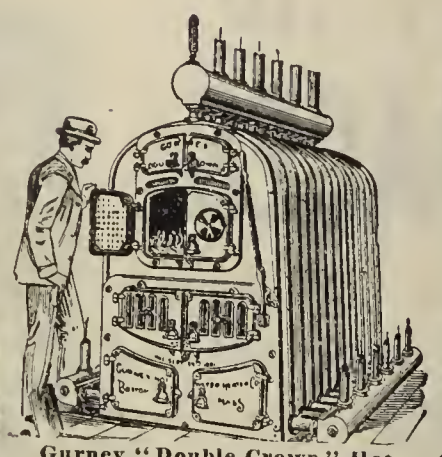
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Gurney

HOT WATER HEATERS, STEAM BOILERS, RADIATORS.



Gurney Hot Water Heater. 300 Series.



Gurney "Double Crown" Hot Water Heater.



Gurney Steam Boiler.

THE BEST

—FOR—

Their Requirements.

Send for Latest Catalogue.

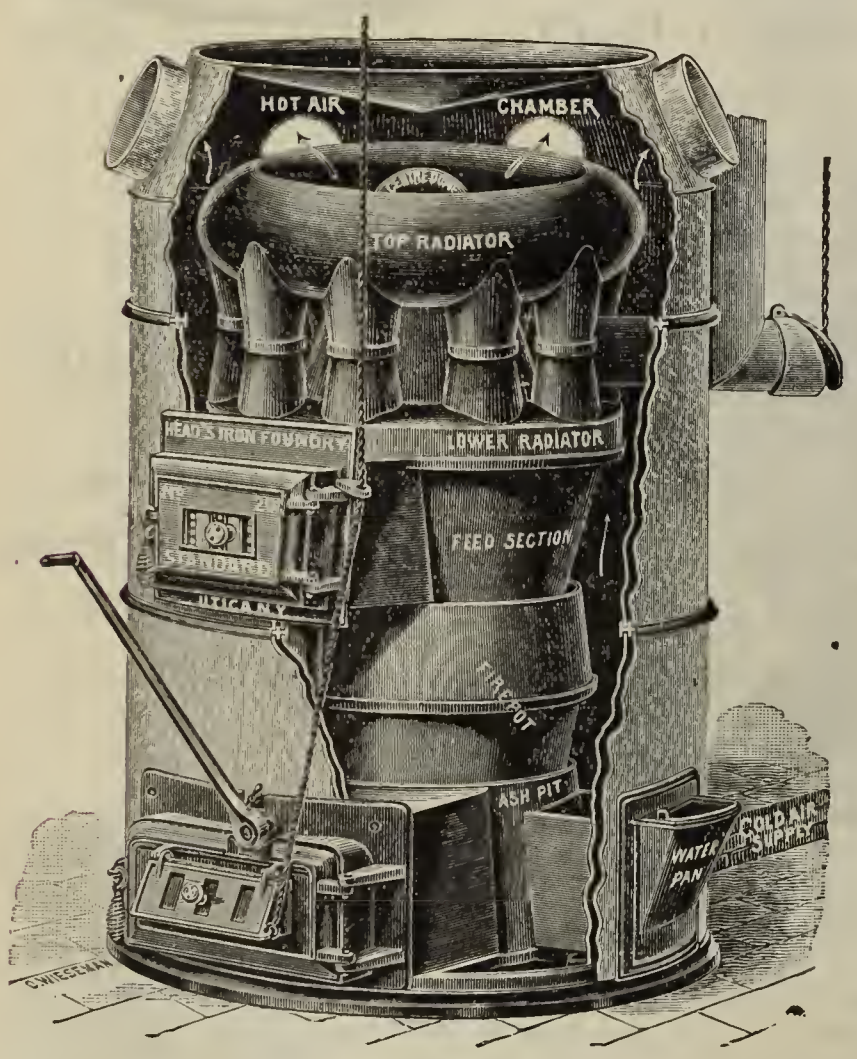
GURNEY HEATER MAN'F'G CO.,

HEAD OFFICE:

163 Franklin St., Cor. Congress, Boston, Mass.

SELLING AGENCIES:

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Standard Tubular Furnace.

Powerful in Capacity.

Durable in Operation.

Economical in Consumption.

WRITE US FOR PRICES.

GIBLIN & CO., Utica, N.Y.



The Weathered Hot Water Heater.

MANUFACTURED BY

THOS. W. WEATHERED'S SONS,

244 CANAL STREET, - - - - - - NEW YORK.

ESTABLISHED 1859. INCORPORATED 1893.

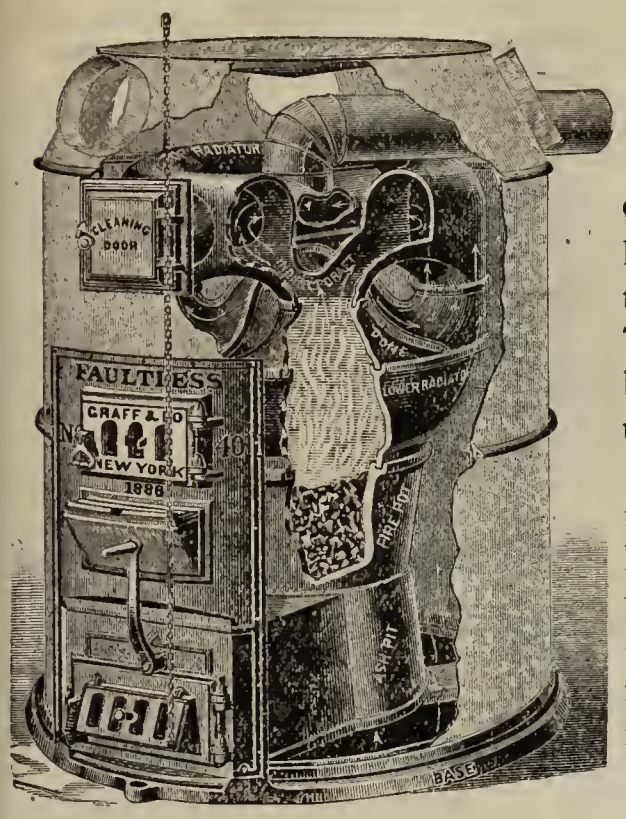
For Heating Dwellings, Greenhouses, Churches, Public Buildings, &c.,

By Hot Water Circulation Only.

OVER 6,000 IN USE.

Guaranteed to be more economical, quicker in circulation and more durable than any heater in the market. Hundreds are in use and doing good service that were put in 25 years ago. Send for our illustrated catalogue, **"Health and Comfort in the Home Circle."**

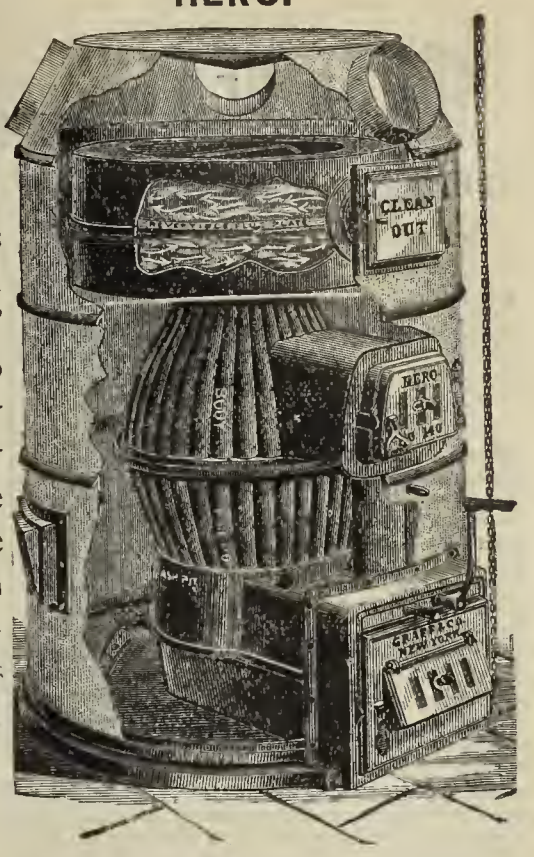
FAULTLESS.



ALONE!

Oh yes! These furnaces have such a reputation that they can "go it alone." They no longer need to be pushed or heralded by us. "We see that your Furnaces and Ranges are in nearly every house we look at," is an expression we hear from house hunters almost daily. All this is the result of a good reputation

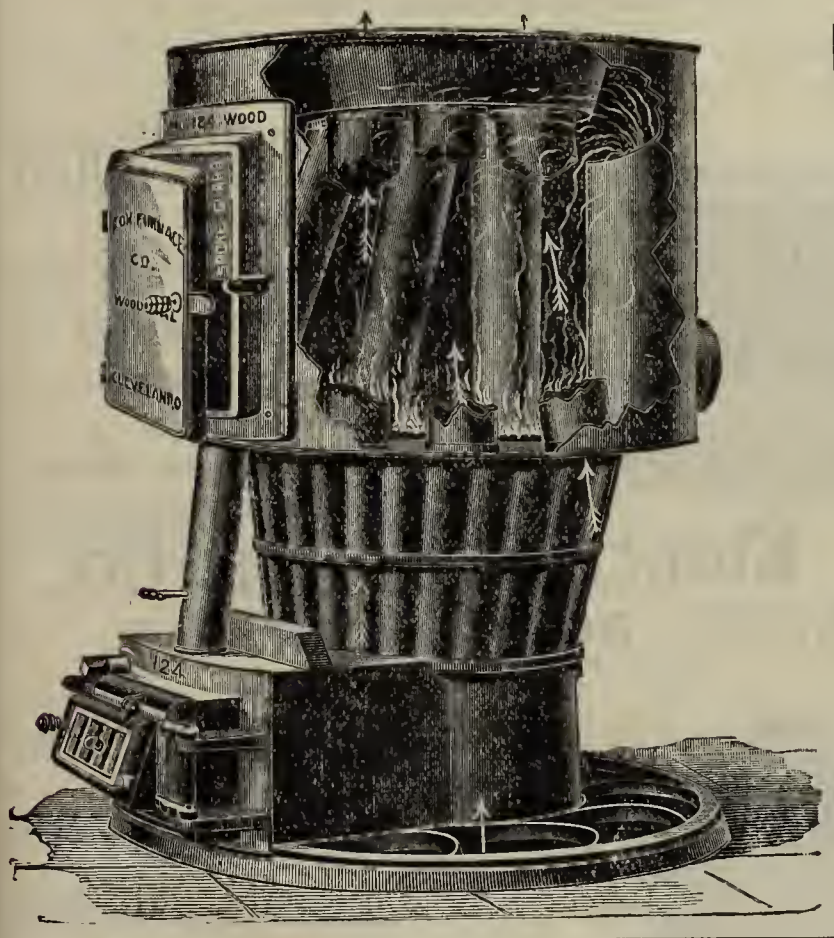
HERO.



—o—

SMITH & BRICHT,
175-177 Lake St., Chicago, Ill.

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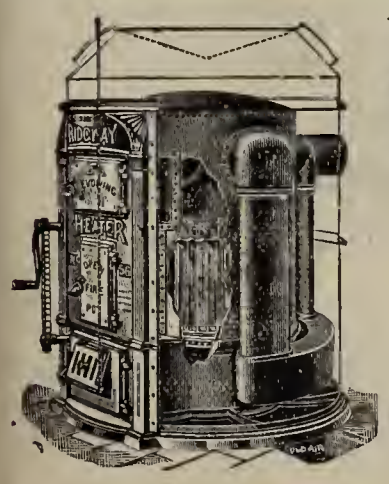
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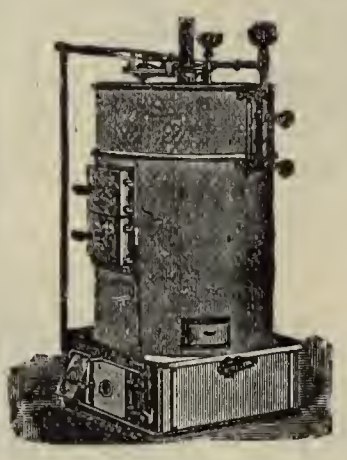
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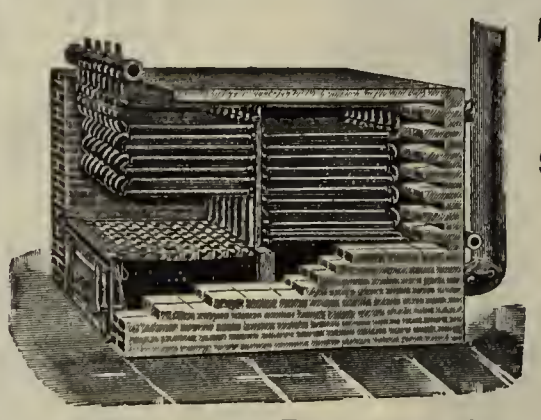
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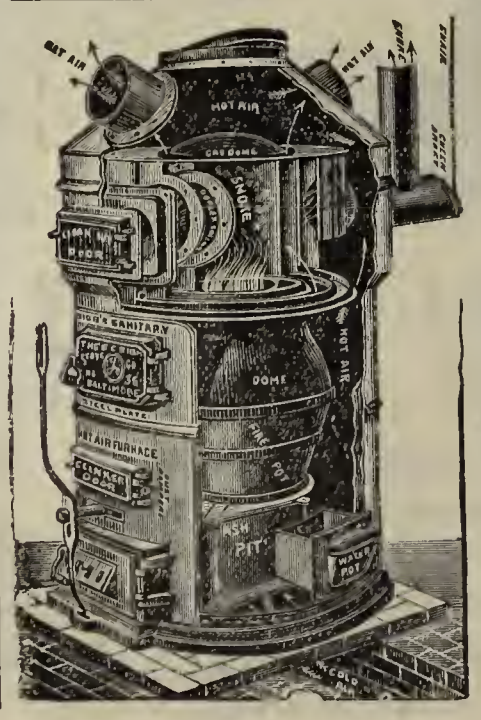
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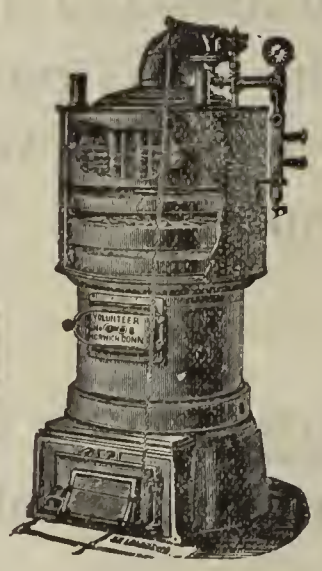
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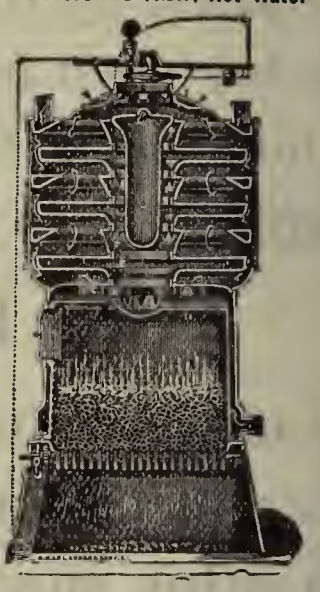
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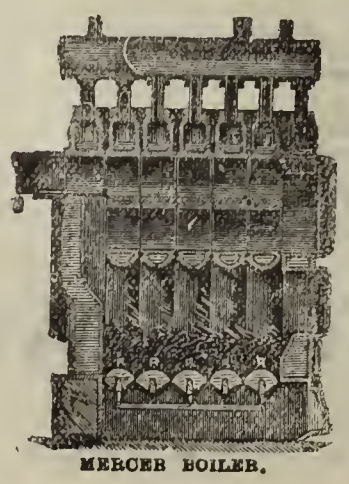
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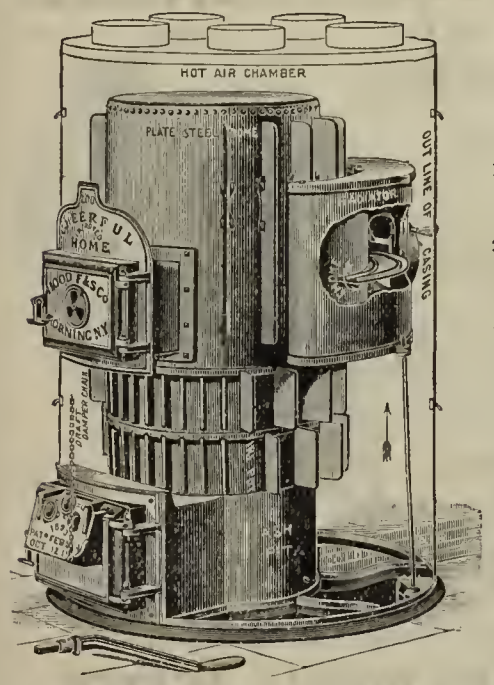
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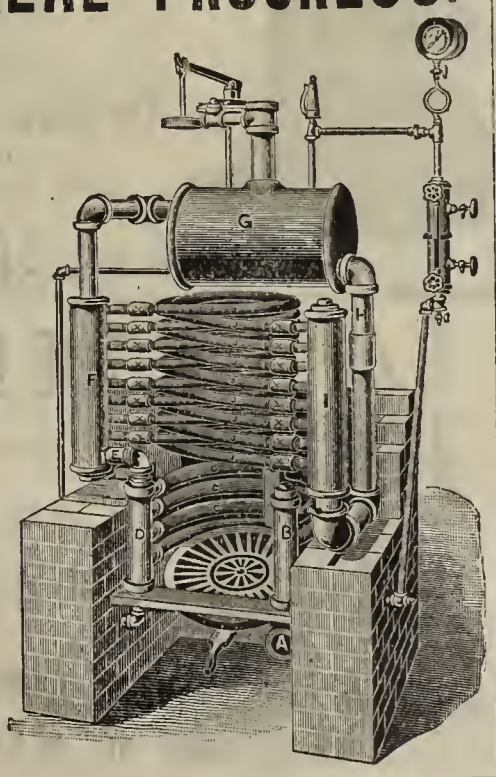
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A writer in *Industry* says: "In this day of lecturing about wastes of one kind or another, it is to be noted that waste of light in workshops has been reached, and it is high time. In districts where anthracite coal or wood is burned, and the interior of a factory or workshop can be kept fairly clean, there is no doubt concerning the advantage of top reflectors, especially when electric lights are employed. In machine shops, which are among the most difficult to light, there are two requirements; one of general light and another of local light, unless, as is hardly possible, a shop is illuminated to such degree that local lights are unnecessary.

"To hang up electric lights beneath a dark ceiling and walls is like firing with the furnace doors standing open. Half the current and the money it costs are wasted. Where this is written we havea room 20 feet square lighted by one sash about 3 x 5 feet in the center of the ceiling, which for comfort and use is better than four windows of twice the size, or eight times the area, around the sides of the room. The light is equal in all parts and sufficient, being deflected by inclined white surfaces below the glass. Top lights have useful effect in a general way four times as great as side lights, and there is no doubt as to the advantage of arrangement in this respect, the best examples showing that with lamps the lights should be shaded below, and the reflected light alone depended upon. The angle of reflectors must be arranged with respect to the size of rooms and hight of lamps above floors. This is a simple problem in a room that is square or nearly so, but more difficult in the case of a long narrow room. In that case the lights should be placed at intervals equal to twice the width of the room."

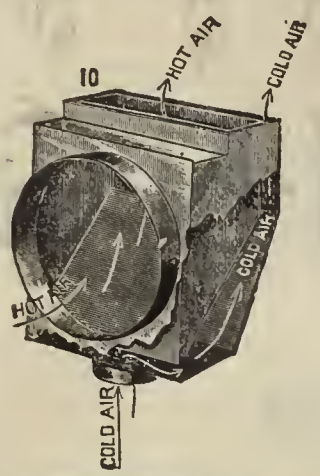
This could very appropriately have been followed by a few suggestions on the value of a thorough sweeping of the rafters and ceiling of the foundry, machine shop or workshop of any character. After such a course of treatment a very profitable return will be made from the investment of time and material in applying a good coat of whitewash.

— Little Pitchers and Big Ears.— Mamma: "Georgie, where is the five cents I gave you to put in the contribution box for the heathen?"

Georgie: "I'm saving it for Aunt Hetty when she comes."

"Why, I ——"

"Georgie: "Cause I heard papa say, 'Is that old heathen coming here again?'" —*Chicago Inter Ocean.*



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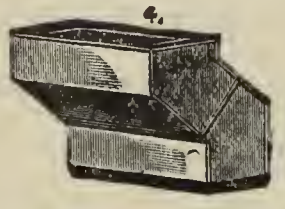
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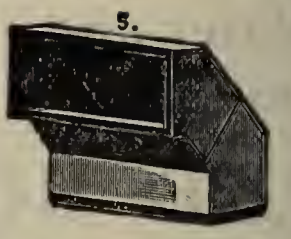
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China may be behind the age, says an exchange, ultra-conservative and semi barbarous in her isolated hostility to the spirit of modern progress, but her people sometimes show a certain wisdom in resisting innovations not unworthy of commendation or even of imitation. In their treatment of that malign product of modern industrial development, the walking delegate, the good folk of Pekin are exhibiting a profound sagacity, accompanied by a certain sense of humor that must command the admiring attention of thinking minds. Finding themselves face to face with a strike on the part of certain mechanics, conducted in due form after the most approved fashion of civilized lands, under the pestiferous leadership of walking delegates, the Pekin people recognized at once these malignants as the prime movers of the disturbance, and proceeded to deal with them accordingly. A number of the more obstreperous walkers, who were constituting themselves a pig tailed nuisance too vexatious to be tolerated, were quietly strangled; but the greater portion of the fraternity were banished to the region of fever and mosquitoes, there to meditate on their misdeeds, and to serve as warning examples to all and sundry their almond eyed brethren likely to be beguiled into the evil ways of that peculiarly effusive variety of foreign devils known as walking delegates.

— HUMANE.— Two Rochester women were discussing the subject of salads, and their construction. The first said:

"Now, for lobster salad I always get a nice live lobster that weighs 1½ or 2 pounds and boil it nicely."

The second broke in with, "How do you kill the lobster! You know, I never buy live lobsters because I think it is so inhuman to kill them by putting them into a kettle of hot water."

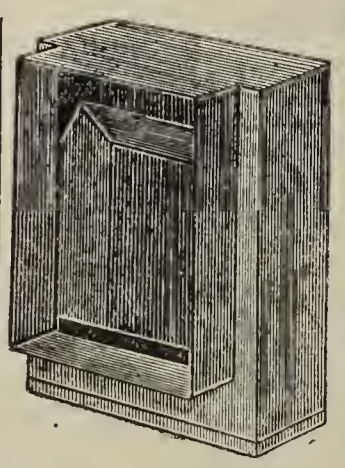
The first woman replied: "Oh, I never kill them that way; that would be too horrible. I always put them on in cold water and let them come to a boil." —*Rochester Post-Express.*

— IN ALL LIKELIHOOD.—"How much is this bird?"

"Five dollars."

"Very well, I'll take it. Send me the bill."

"The bill? Yes, sir; but you'd like the rest of the bird, I presume?"—*Music and Drama.*



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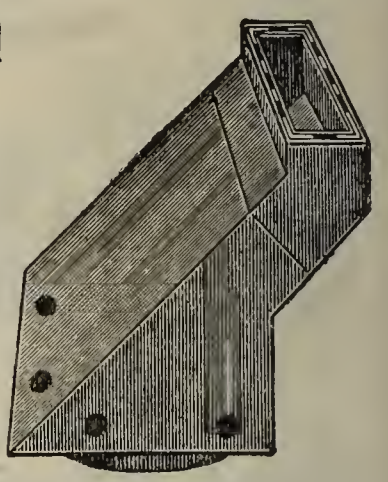
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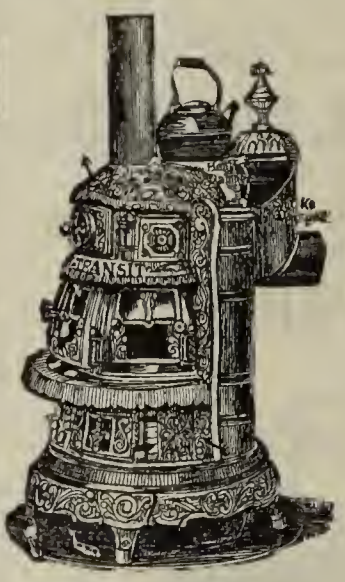
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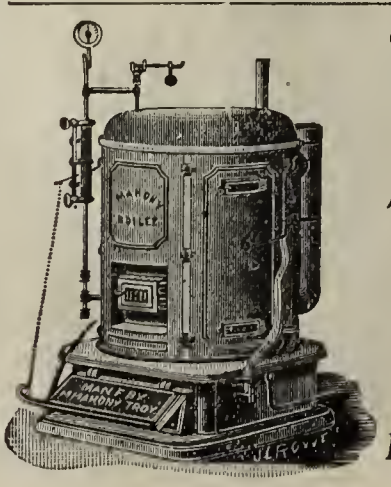
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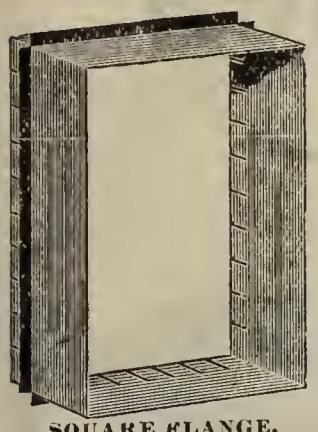
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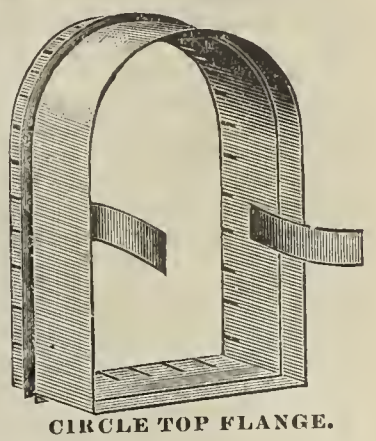
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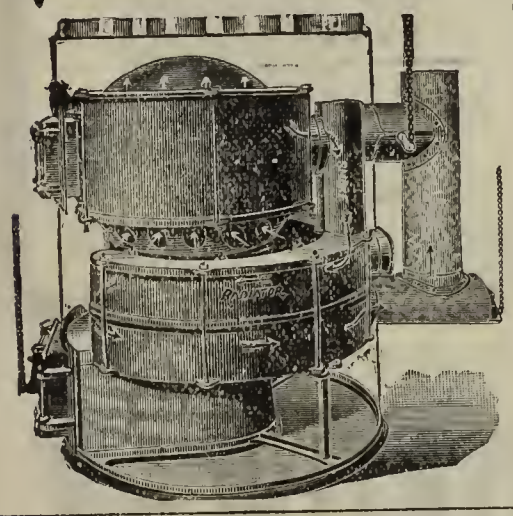
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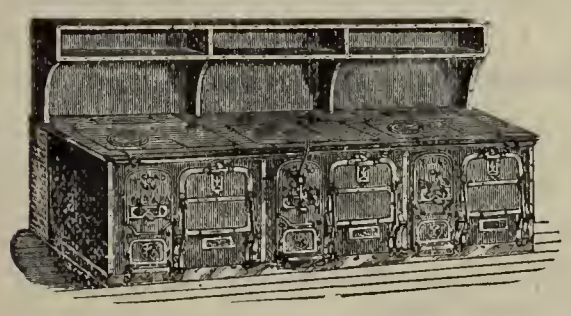
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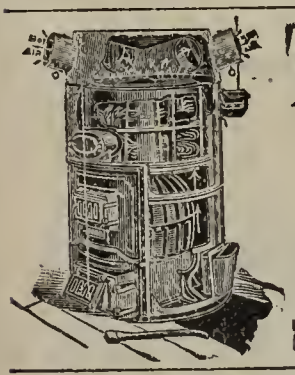
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A Substitute for Glass.

A curious substitute for window glass, known as tectorium, has been for some time employed in Austria, Italy, Germany, Switzerland and Russia as a covering for hothouses, verandas, roofs of stores, windows of factories, &c. It is, says *La Nature*, a special, insoluble, bichromated gelatine, translucent as opal glass and incorporated in wire gauze. It refracts the rays of the sun, and, while possessing the translucency of opal glass, is tough and flexible, bends without breaking, is not injured by frost and does not dissolve in water. It is a bad conductor of heat, and when exposed to the air becomes stronger and stronger. Upon passing a slight coat of paint of oil color over the tectorium one obtains an imitation of stained glass difficult to distinguish from the genuine article. It is easily cut with shears and may be given any form that is desired.

To properly utilize tectorium, it is necessary to nail it to the wood of the window like ordinary glass. When it is a question of employing it upon iron, it is necessary to first cover the latter with small laths and fix the tectorium to them with nails (large headed ones by preference) somewhat distant from the edge of the material.

Tectorium is easily repaired, provided that the damage is not too great. Some manufacturers who employ the material with success assert that it is not only a very curious substitute for glass, but that it may be considered as much cheaper, owing to the long time it lasts, its resistance to breakage, &c. It is manufactured in pieces 23 feet long by 4 in width.

Employed for roofing buildings, hothouses, factories, &c., the tectorium, having to withstand rain, snow, &c., must be firmly and carefully fixed to the T-irons that generally compose the frame work of such coverings.

— A PRINCIPLE INVOLVED.—"Quirk: "Didn't you bet me $5 the 'Valkyrie' would win?"

Gammon: "I did,"

"Well, the 'Valkyrie' lost, didn't it?"

"It did."

"You haven't offered to settle, have you?"

"I have not."

"Well, when are you going to settle?"

"Look here, Quirk, I am not going to pay that $5. In the first place, it's wrong to bet. It follows logically, in the second place, that it's wrong to pay a debt. I was weak enough to commit the first wrong, but I draw the line at the second. Two wrongs never make a right. There's a principle at stake in this thing. I've got to meet a man round the corner. Good morning."—*Chicago Tribune.*

Money Value of Hands and Fingers.

The following estimate of the relative value of the hands and of the several fingers is taken from the *British Medical Journal*. According to a scale drawn up for the Miners' Union and Miners' Accident Insurance Companies of Germany, the loss of both hands is valued at 100 per cent., or the whole ability to earn a living. Losing the right hand depreciates the value of an individual as a worker 70 to 80 per cent., while the loss of the left hand represents from 60 to 70 per cent. of the earnings of both hands. The thumb is reckoned to be worth from 20 to 30 per cent. of the earnings. The first finger of the right hand is valued at from 14 to 18 per cent., that of the left hand at from 8 to 13.5 per cent. The middle finger is worth from 10 to 16 per cent. The third finger is valued at no more than 7 to 9 per cent. The little finger is worth 9 to 12 per cent. The difference in the percentages is occasioned by the difference in the trade, the first finger being, for instance, more valuable to a writer than to a digger.

Didn't Believe It.

Proportionately to population, says the Detroit *Free Press*, Indiana has more money to spend on schools than any State in the Union. It was in Indiana, not so very long ago, that the daughter of an old White River farmer was reading the county paper to him. She had got to the "Personals," and read this:

"Mrs. Willie Morritts, *née* Black, has returned from a visit to her parents in Indianapolis."

"I don't quite understand that," said the old gentleman.

"What don't you understand?" inquired the daughter.

"That part about 'Mrs. Willie Morritts nay Black.' What does that 'nay black' mean?"

"Oh, that's French and means she was born Black."

"Born black!" exclaimed the father, excitedly.

"Yes; *née* is French for born."

"Well, it ain't so," ejaculated the old man, jumping up and shaking his fist; I knowed her parents and they was as white as anybody that ever lived in Indianny, and I'll see that editor about it," but before he could get away the daughter explained matters and the old gentleman cooled down.

— INORANCE NO BAR. — Farmer Edmunds, as he was generally known in the Fifty-first Congress, was a new Congressman, fresh from the fields, and he was somewhat surprised to see that Speaker Reed had assigned him to the Committee on the Revision of the Laws. He went to Mr. Reed in sore distress.

"I know nothing about law, Mr. Speaker," he said; "I am a farmer."

"Don't give yourself any uneasiness," was Mr. Reed's reassuring reply. "In the first place, your committee will never have anything to do, and in the second place, you are no worse off than I was when I came to Congress. I was put on the Committee on Territories, and to tell you the truth, Mr. Edmunds, I would not have known a Territory if I had met one walking down Pennsylvania avenue."—*Washington Post.*

— VERY LIKELY.—Judge (to prisoner): "Did you really call this gentleman an old fool last night?"

Prisoner (trying to collect his thoughts): "The longer I look at him the more probable it seems to me that I did."—*Truth.*

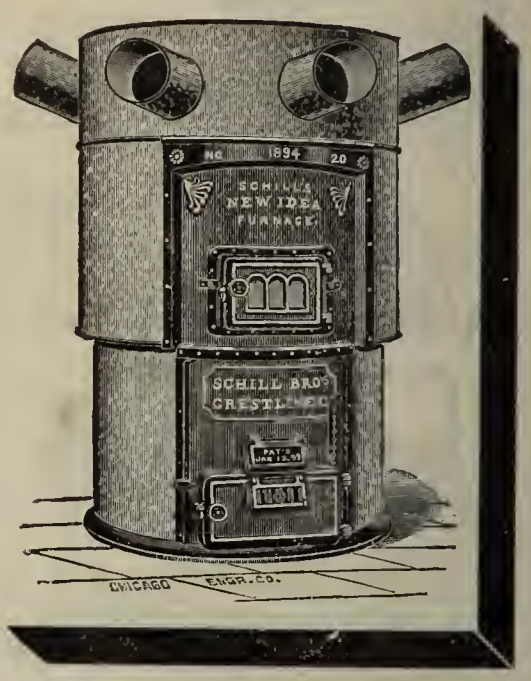
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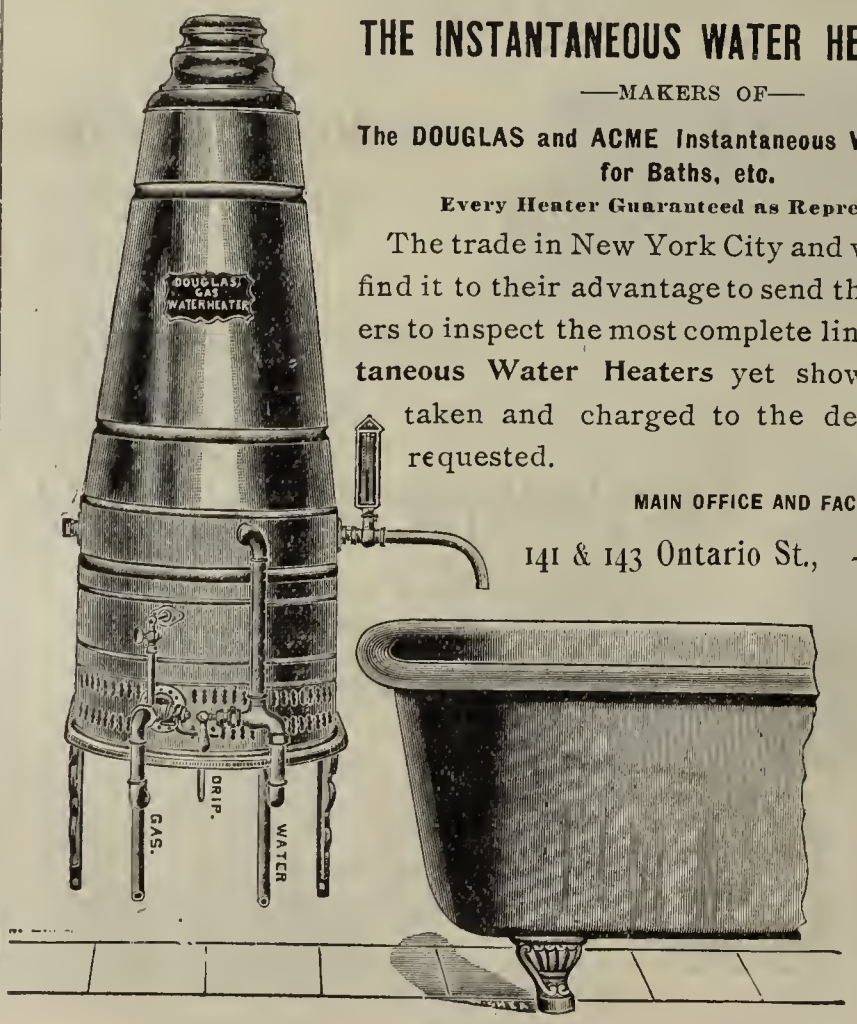


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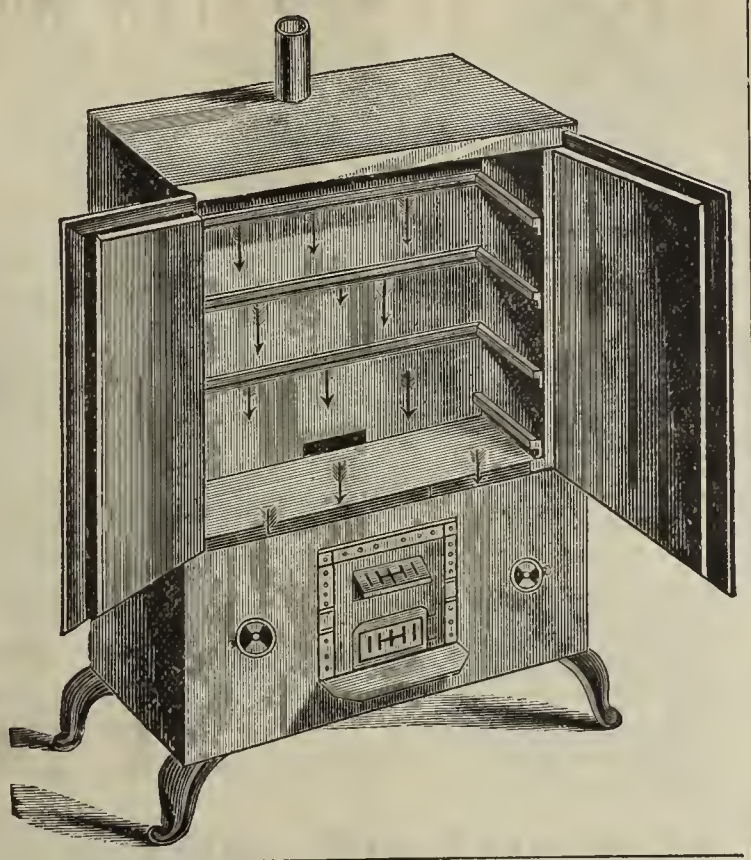
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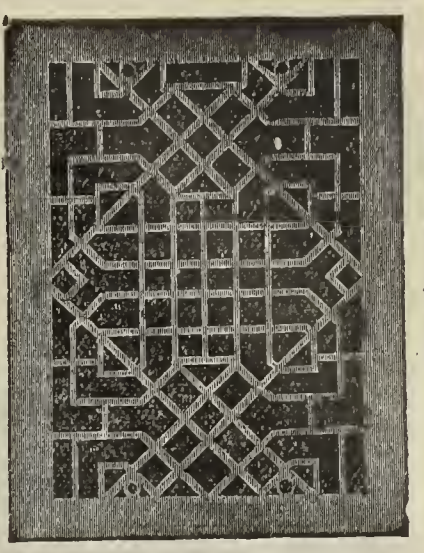
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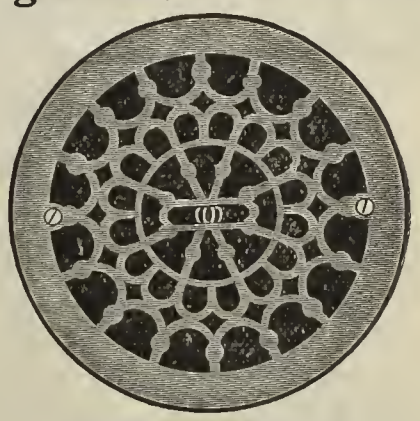
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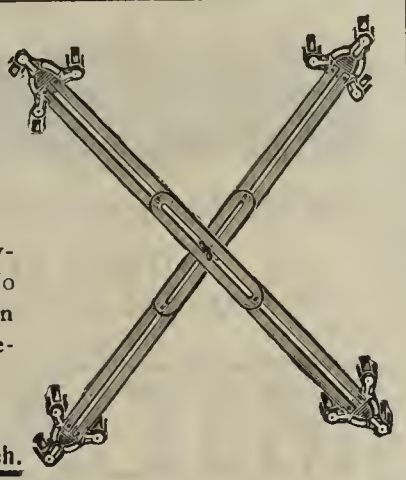




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STELLWAGEN & KYNOCH, St. Ignace, Mich.





Looked at Squarely, and from an Economical Standpoint,

Hodge's Duplex Damper

SHOULD BE USED ON EVERY

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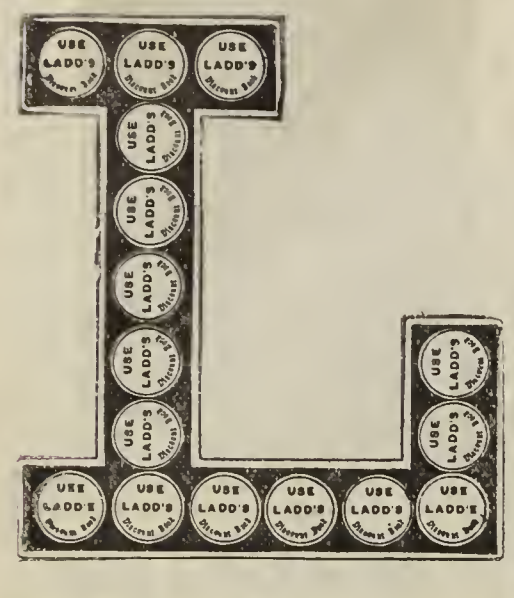
as they hold the heat back, retaining it just where it is wanted, with no smoke or gas in the room, saving 25 per cent in fuel.

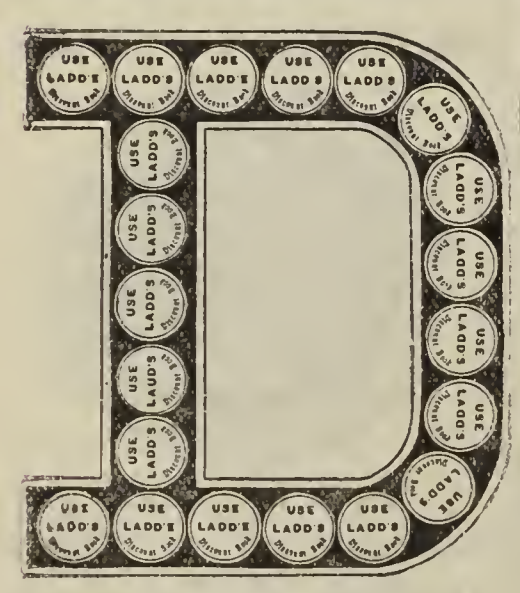
SEND FOR CIRCULARS.

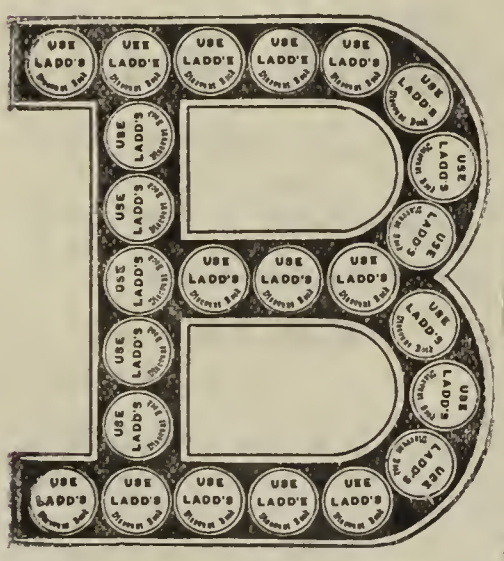
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Young Chicagoan (reflectively): "What are the other seven? Oh, yes, the Auditorium, the Masonic Temple, Armour's slaughter house, the water works, the town of Pullman—why I don't see how you make out seven."—*Life.*







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Will run your Sewing Machine, Fans and other Light Machinery.

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Gentlemen:—Your No. 1 Motor just received. I am more than pleased with it. It will do all you claim for it. I have tried it with several different kinds of light machine work. I shall always have the best word to say for this little wonder. Yours truly,
CHAS. E. PARKHURST, 79 Walnut St.

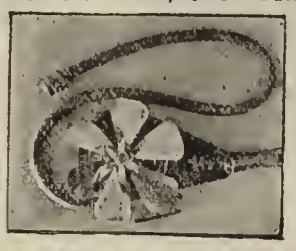
NOBLESVILLE, IND., Jan. 29, 1894.
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Gentlemen:—The "Little Giant" Water Motor came to hand in due time, and works the sewing machine like a charm.
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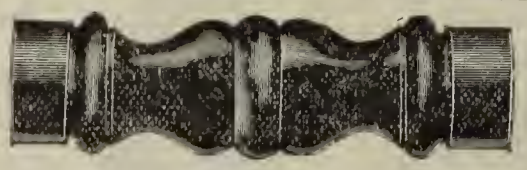


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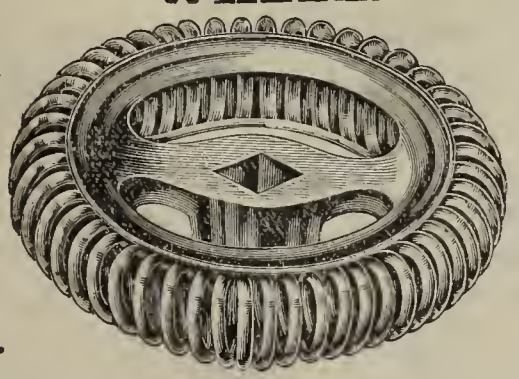
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List,	.14	.16	.18	.21	.24	.27	.30		

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— EVERY DAY DEFINITIONS.—The poet Tennyson could take a worthless sheet of paper, and by writing a poem on it make it worth $65,000—that's genius.

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The United States can take 1¼ ounces of gold and stamp upon it an "eagle bird" and make it worth $20—that's money.

The mechanic can take material worth $5 and make it into a watch worth $100—that's skill.

The merchant can take an article worth 75 cents and sell it for $1—that's business.

A lady can purchase a very comfortable bonnet for $3.75, but she prefers one that costs $27—that's foolishness.

The ditch digger works ten hours a day and shovels three or four tons of earth for $2—that's labor.

The editor of this paper can write a check for $80,000,000, but it wouldn't be worth a dime—that's rough.



No. 01 B. & B. Lamp Stove.

List Price, $8.00 per dozen. Code Word, *Garden*. Packed one dozen in box. Weight 50 lbs. Height, 8½ inches. Size of Tank, 3½x5½ inches. NICKEL FRONT. Four-inch wick.

Dealers who Handle B. & B. STOVES

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There are no old relics or fossils in the B. & B. line.

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Our competitors try to imitate, but the race is too rapid for them.



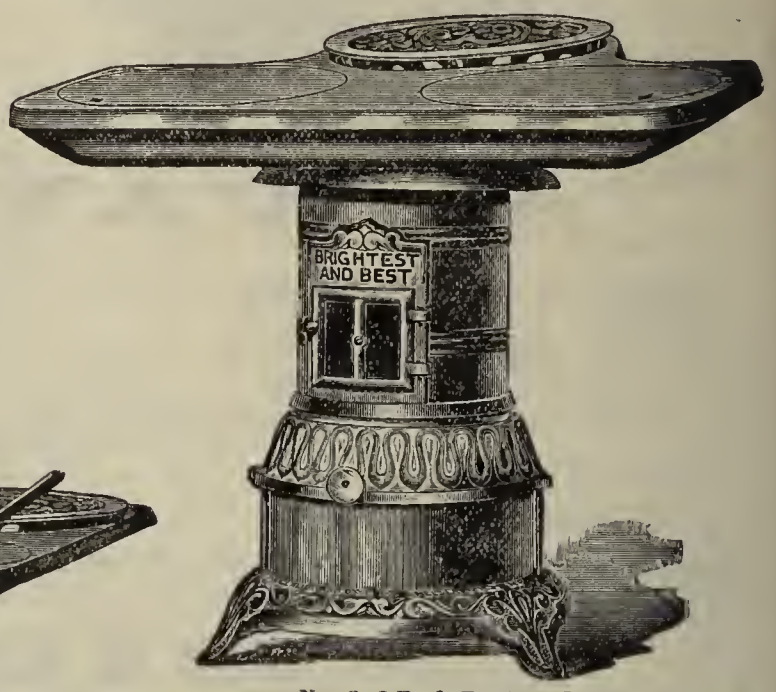
No. 02 B. & B. Lamp Stove.

List Price, $16.00 per dozen. Code word, *Garter*. Packed one dozen in box. Weight, 85 pounds. Height, 8½ inches. Size of Tank, 5½x5¾. NICKEL FRONT. Two 4-inch wicks.



No. 03 B. & B. Lamp Stove.

List Price, $24.00 per dozen. Code word, *Gauge*. Packed ½ dozen in box. Weight, 65 pounds. Height, 8½ inches. Size of Tank, 5½ x 8½ inches. NICKEL FRONT. Three 4-inch wicks.



No. 6—3 B. & B. Cook Stove.

Nickel Finish. List Price, $7.00. Extension Top with three holes for 8-inch ware. B. & B. Patent Brass Oil Tank. 10-inch double thick circular wick.



No. 44-4 B. & B. Cook Stove.

Nickel Finish. List Price, $7.50. Extension Top with four holes for 8-inch ware. Four 4-inch flat wicks.



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Nickel Finish. List Price, $3.50. 7½ inch double thick circular wick.

B. & B. Lamp Stove Ovens are made with patent adjustable bottoms and will fit any lamp stove ever made.

B. & B. Cook Stove Ovens are interchangeable on over twenty **B. & B. Cook Stoves.**

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THE METAL WORKER.

NEW YORK AND CHICAGO.

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Index to Reading Matter.....Page 48.

Mechanical Ventilation.

This term has been adopted to distinguish ventilation effected by the use of ventilating fan wheels, &c., from that obtained by the direct application of heat to or in ventilating flues. There are two general ways in which the latter is accomplished : A flue may be heated from the outside—an example is a metal ventilating flue run up through a smokestack—or the inside of a flue may be heated by steam or hot water coils or other appliances. In any and all the variations of apparatus employed to effect circulation in flues, except in rare cases where fans, &c., may be driven by water or wind power, heat must be expended to produce the result ; and even in such cases the exception is apparent rather than real, since all power derived from natural sources is drawn from stores of energy depending for supply upon the heat of the sun. Strictly and scientifically speaking, therefore, all ventilation is mechanical ; that is to say, it involves the production of motion in air currents by the use of previously confined forces, and the store of such forces drawn upon is so generally contained in fuel that the latter need only to be considered in estimating the economy of different systems.

Economy and Efficiency.

But economy cannot alone be a controlling element in any system of ventilation. Efficiency and certainty also demand careful consideration. No matter how cheap any system may be, if it cannot be relied upon to give ample ventilation under all the conditions imposed upon it in its working it remains a defective system. The whole question between what are called "mechanical" and "natural" ventilation simmers down to this : In which of these two methods can a given required degree of efficiency and certainty be obtained with least first cost and current expenditure? Now since the degree of these qualities required for different buildings may and does vary greatly, the answer to the question can be the same only when the requirements are similar. There is no dispute that a system of natural ventilation possessing sufficient certainty and efficiency for average dwellings can be had for less cost than mechanical ventilation. But between the nearly minimum requirements for home ventilation and the maximum demanded for large hospitals and schools there is a long range of intermediate wants ; and for those the question must be decided with special reference to each particular set of requirements. It is only in the extreme cases named that the question may be considered as definitely and finally settled.

Heating Calculations.

There exists a certain form of reciprocity, a kind of give and take, in all scientific calculation, and thus in the art of heating we find that as one body gives up its heat another absorbs it, and as heat is transformed into work in the movement of air so is the work done under certain conditions transformed again into heat. The fact that we cannot calculate more accurately the results to be secured by the introduction of some given device or by the mere supply of a given volume of air at a stated temperature, is not due to any lack of direct knowledge of the laws governing the flow of fluids, the transmission of heat and the like, but rather to the important influence of the material, the porosity, the conductivity and the specific heat of building walls, floors, and ceilings. While the data required for accurate calculation may be amplified and greater certainty assured, yet in the nature of things there will always be a great difference existing even in construction by different parties, but under the same specifications ; so great, in fact, that absolute accuracy can never be attained, although the approximation may be very close. There is, however, a certain field of calculation in heating work with which every man in the business should be reasonably well acquainted. It is desirable, for instance, to know the volume of the thermal unit, to know how to calculate the increase in temperature of a given volume of air if heated by the condensation of a given weight of steam, to know what is meant by the latent heat of steam and of what importance this latent heat must be in a steam heating system. Even an approximate knowledge regarding the total number of heat units in a pound of good coal and the number required for the evaporation of a pound of water at a given temperature may be of marked service in arming oneself against the declarations of the man with a coal saving compound that according to his figures of water evaporated per pound of coal would make efficiency of the coal somewhat above the maximum of 100 per cent. Doubtless some of the most disastrous failures in the line of heating and ventilation have occurred, not so much through absolute ignorance, as on account of the total disregard of simple and well-known methods of calculation whereby the results of the experiment could have been accurately and definitely determined.

The commencement exercises of the departments of fine arts, domestic science, science and technology (which includes the trade school), commerce, &c., of the Pratt Institute, Brooklyn, were held on Friday evening, June 22. The great hall of the institute was crowded by the graduates and their friends, who listened with attention to excellent and helpful addresses by Mrs. Ellen H. Richards of the Boston Institute of Technology, Hamilton W. Mabie of New York, and Charles M. Pratt, chairman of the Board of Trustees. Mrs. Richards gave a thoughtful address on the American home, speaking of the improved hygienic conditions of the modern home and the great influence of the Pratt Institute in this direction. Mr. Mabie's address was devoted to the subject of education, and the value of a thorough training in life. Diplomas were conferred upon the graduates of the various departments, after which the students held an informal reception in their several class rooms, the trade school building being particularly well filled with visitors, who admired the samples of the work of the 1893-94 classes there displayed.

The *Plumber and Decorator* of London remarks that in the ventilation of churches and school houses and public buildings generally, a very common mistake is made. Those in charge frequently fail to open all the windows immediately after the buildings have been vacated. The exhalations from the lungs and the emanations from the body, being light, will float for a while in the atmosphere before falling to the floor, and if the windows be opened at once, so that a current of air can cross the hall, many of them will be carried out. If, however, as is usually the case, the windows are not opened for some hours, may be not till the next day, these particles, settling upon the floor, are not carried away, but when the hall is again occupied are by the feet thrown up into the atmosphere and inhaled by the lungs, from which they had been exhaled the day before.

THE LETTER BOX.

Water Heating from Low Pressure Steam.

From J. B. C., *New York.*—I would like to know if a low pressure boiler (pressure 10 pounds) such as is used in heating flat houses in this city, could be employed in heating a hot water boiler of 600 gallons capacity, with a coil of one to five, and heat a maximum of 450 gallons per hour, or an average of 250 gallons per hour, or what should be the minimum of pressure of steam to heat such a boiler. I have noticed flat houses having passenger elevator where the hot water boiler was heated with the exhaust of pumps, they having also connection with the live steam, to be used when the passenger elevator was not running. I have also seen exhaust steam used in the heating system of a flat. Please let me know what is the approximate pressure from the average steam pump for passenger elevator.

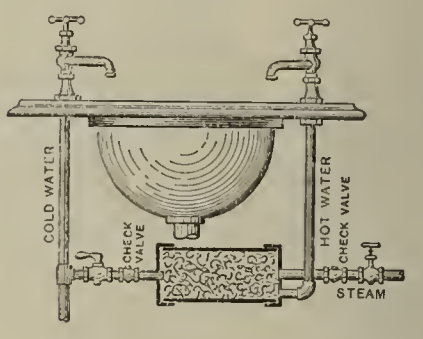
Answer.—Our correspondent's query is so indefinite that in replying to it several assumptions must be made. He does not say whether the steam boiler is to be employed entirely for heating a hot water boiler of the capacity named, or whether it is also to be used for heating the building. In answering his inquiry we shall assume that the heating boiler is required, at least in cold weather, to perform the double duty of heating the building and the amount of water specified. First, the ability of the heating boiler to perform the double duty will depend upon its steaming capacity. Under the assumption that 600 gallons of water are to be heated to a temperature of 212° F., the weight of water to be heated per hour will be 5003 4 pounds. Assuming also that the temperature of this water as fed to the hot water boiler in extreme weather will be 40°, there will be required 860,-584.8 heat units to raise the water to a temperature of 212°. This amount of heat would be obtained by the condensation of 890.6 pounds of steam. To heat 450 gallons would require the condensation of 668 pounds of steam within a small fraction. To heat 250 gallons would require the condensation of 371 pounds of steam. The first named condensation per hour represents the steaming capacity of a 30 horse-power boiler. The second condensation represents the capacity per hour of a 22 horse-power boiler. The third condensation is equal to the amount of steam that could be generated per hour by a 12 horse power boiler. This estimate is based on an evaporative power of 30 pounds of water per horse-power per hour, and the supposition that the water fed to the steam boiler from the returns is not cooled after condensation to a temperature less than 178.5° F. It will be seen that if it should require, say, a 20 horse-power boiler to heat the building, that to heat in addition 250 gallons of water per hour, taken from the mains at a temperature of 40° F., would require a total horse-power of 32. Probably the back pressure in using exhaust steam for heating, whether from steam pumps or other non-condensing engine, will average in good general practice about 4 pounds. Steam exhausted at this pressure is substantially as fit for heating purposes, whether of air space or of water in tanks, as if it were generated in a low pressure boiler expressly for heating. If steam for heating the building and for heating a tank be supplied from a low pressure boiler there is no difficulty in so arranging apparatus as to effect a return of condensed water to the boiler by the action of gravity alone. If the primary boiler be used for the three purposes of supplying power for elevators or dynamos, for heating the building and for heating a tank to supply hot water to occupants, it will be necessary to employ pumps, traps or steam loops to effect the return. The mistake is sometimes made of supposing that because the exhaust from a steam engine can be used advantageously for heating purposes, the same effect could be obtained by drawing steam from the returns of a heating plant. This can only be done by employing a sufficiently large boiler to heat both the building and the tank. Even then it would not be the best way to draw steam from the return main. The correct plan is to take live steam from the boiler or from the steam main for heating the tank, and return the condensed water from the coil in the tank in the same manner as it is returned from the radiators.

Choked Water Backs.

From W. F., *Hoquiam, Wash.*—I have been looking over some of the replies to the inquiry of "E. J. Y.," Regina, N. W. T, that appeared in *The Metal Worker* of May 19, concerning choked water backs, and I find that the one from "E. S. M.," Westminster, Md., in *The Metal Worker* of June 2, very nearly hits the mark. I have had quite an experience with water backs on the Pacific Coast, and in some cases they would choke up in no time, but to overcome the difficulty the only thing required is to construct the water back so that the water circulating through it will not get hot enough to boil. In case of any trouble like that mentioned, I have either increased the size of the pipe used or decreased the number of pipes in the coil, so that the water in the pipes and boiler would never come to a boiling point. This plan fixed the matter for good every time.

A Method of Heating Water.

From T. O. H., *Terra Haute, Ind.*—I send herewith a sketch which shows how hot water was secured at a wash basin in a building in which there was no hot water system. A branch was taken from the pipe that carried cold water to the cold water faucet and run to one end of a chamber, which was filled with pebble stones. At the other end of the chamber two connections were made, one to receive steam, as there was a power plant in the building from which steam at any time could be secured; the other to convey hot water to the hot water faucet at the wash basin. Check valves were placed in the steam pipe and in the cold water pipe



A Method of Heating Water.

on each side of the chamber to prevent water passing down the steam pipe when the steam pressure was not as strong as the water pressure and to prevent the steam from holding the water supply back when the steam pressure was the stronger of the two. The pebble stones were placed in the chamber to prevent the steam making a direct passage to the hot water supply pipe. The satisfaction derived from this arrangement may truly be said to be variable, but is sufficient for the purpose for which it was intended. Thinking that this contrivance might be of interest to the readers of *The Metal Worker* I have sent it in, and have no doubt that many other readers of the paper come across just such interesting novelties in their practice as this, and I trust they will return the favor which I think I am contributing by sending in letters and sketches of what they find.

Heating from Furnace Coils.

From CÆSAR, *Louisville.*—The subject of heating from furnace coils is a very difficult one to handle. In regard to coil in a furnace for the heating of one or two rooms at a distance I would say that I have always steered clear of such adjustments whenever and wherever they have bobbed up, for the following reason, which I think will cover a majority of cases: It is impossible to adjust the proper amount of water necessary to the heating of one or two rooms to the body of fuel neeessary to heat the balance of the building with-

out constructing a cumbersome and illy balanced job. In cases where it was impossible to reach the rooms with warm air, I resort to the combination plan and heat the lower floor with warm air and the upper floors with hot water or steam. By this plan I obviate all of the trouble resultant from the coil practice. Another reason is that I have never seen a building yet that could not be heated with warm air if the owner would pay the price. A combination can be balanced perfectly and if placed by a competent man the results are always satisfactory. I do not care to enter into an argument on this question, viewing it from the standpoint that I do that the majority of such attempts are failures, and I think that a close investigation will bear me out in the premises.

The Crosby-McDonald Automatic Soldering Machine.

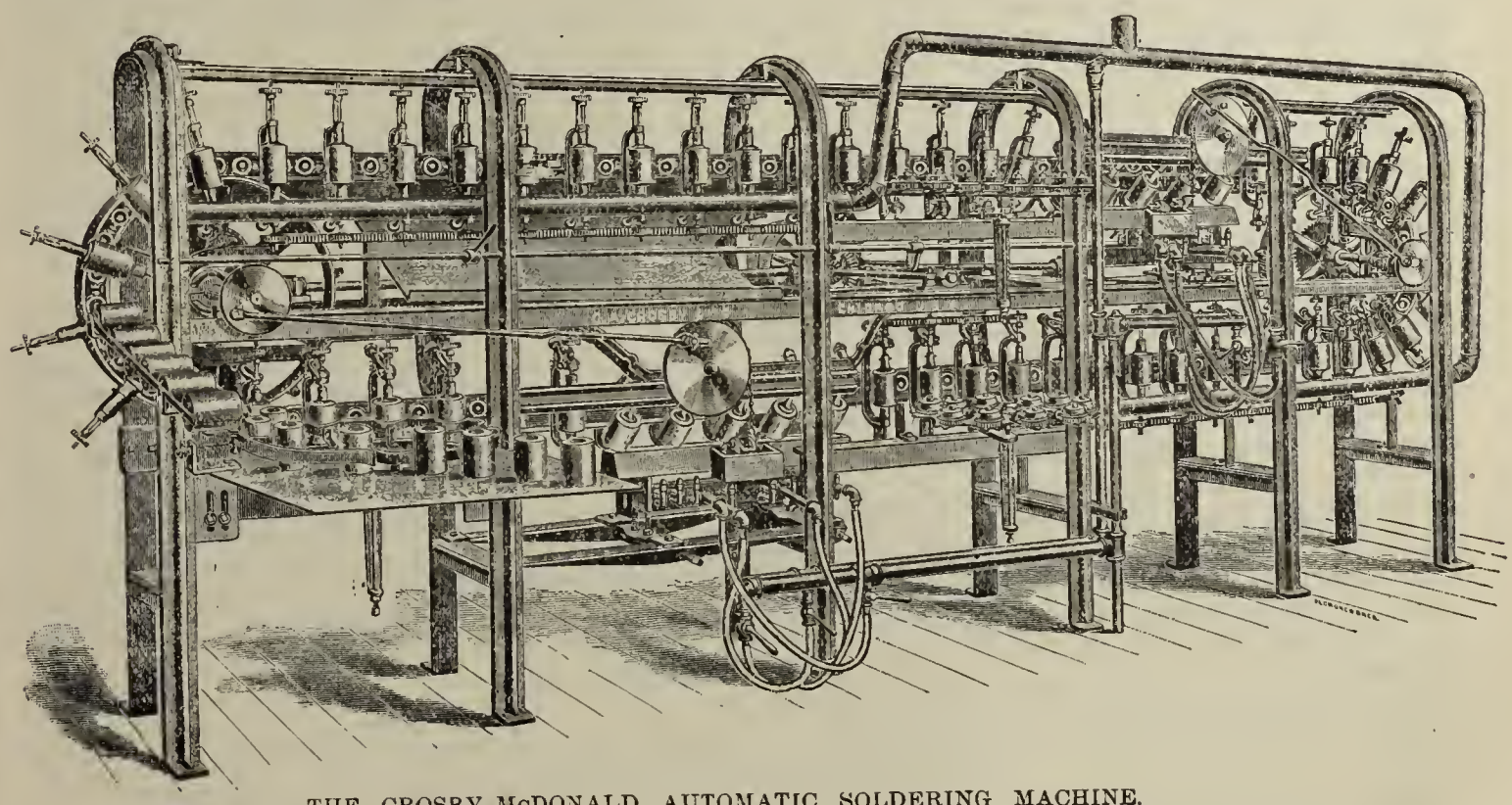
This machine, intended for the use of can manufacturers, is manufactured by G. A. Crosby & Co., 176 and 178 South Clinton street, Chicago. It has been subjected to very thorough and even severe tests, from which it has emerged with most flattering results. An illustration of the machine is presented herewith.

It is designed to solder both tops and bottoms of round cans on to the bodies, this being accomplished and the can wiped, cooled and automatically discharged from the machine without handling. For heating the solder either gas, gasoline or kerosene may be used as the manufacturer prefers.

The cans are carried by a feeding device from the feeding table to the chucks, where they are automatically centered and clamped. As the chucks containing the cans are carried forward they assume an inclined position, and one end of the can is rolled through a bath of molten solder, the bath being of sufficient length to allow a 3-pound fruit can to be revolved therein about four times. As the can emerges from the bath the carrier brings it again to an upright position and it passes by an automatic wiper, which removes all surplus solder and dross, leaving the metal perfectly clean and bright. The can is then carried past a length of perforated pipe, through which a blast of cold air is forced, causing the solder to cool and set before it passes around the end of the machine, where it is reversed and the other end subjected to exactly the same process as above described, after which the cans are automatically discharged from the machine into whatever receptacle is provided for them.

The cans are revolved from the instant they are clamped in the chucks until they leave the machine, thus allowing the solder to settle evenly and soak well in between the burr of the ends and the bodies. The solder bath is adjustable in all directions so that it may accommodate various hights and diameters of cans. The solder is not melted in the same bath through which the cans revolve, but in an adjoining bath, from whence the molten solder is introduced into the soldering bath by an automatic feed. This insures an even temperature in the soldering bath, as the molten metal is not cooled by the addition of new solder; and, as exactly the same amount is fed in that the cans in their passage take away, the solder is always at the same hight in the bath. Two boys are required to operate the machine, which thus attended will solder the tops and bottoms on to from 35,000 to 40,000 cans in ten hours' time.

The machine is constructed in the best manner. All gears are cut and all wearing surfaces are fitted with the utmost accuracy. Each of the several can carriers runs upon a separate and independent set of trucks, thus reducing friction to a minimum. The machine occupies a floor space 4 x 20 feet and stands 4 feet in hight. The firm state that they have several of these machines in operation in some of the largest packing establishments of the United States.



THE CROSBY-McDONALD AUTOMATIC SOLDERING MACHINE.

Prospects in the building trade of Philadelphia appear to be hopeful, if recent reports from that city are reliable. The Philadelphia *Record* announces that Frank H. Rhodes will build 138 houses on Opal and Garnet streets; that John S. Serrill has plans under consideration for the erection of 120 houses on Lehigh avenue; that T. B. Roberts has already started work upon 163 in Twenty-ninth and Master streets, and that James and Charles Maguire have concluded negotiations for a site on which to build 80 dwellings. On the whole, the good building record of 1893 is likely to be eclipsed in the Quaker City this year, if all these plans materialize.

A Boston Passenger Station.

The new Union Passenger Station at Boston of the Fitchburg and Boston & Maine Railroads possesses several noteworthy features, especially in relation to its train shed, and for its heating and lighting system. These are described by a local paper as follows: Twenty-three tracks had to be covered, and to accommodate them a train shed 540 feet long and 472 feet wide has been built. Part of this is an old shed, the new portions consisting of eight spans covering two tracks each, and one span covering a single track. This structure is built of 1500 tons of steel and glass, the latter having an area of nearly 4 acres, and is supported on 128 columns. The lighting and heating apparatus form one of the largest isolated plants in the country. There are 12 125 horse-power boilers, of which six furnish steam at 80 pounds pressure for heating, and six supply the engines with steam at 125 pounds. Instead of building a high chimney, the draft for the boilers is furnished by two powerful steam fans, 11 feet in diameter. Two air compressors for the interlocking apparatus, a number of pumps, five 200 horse-power and one 100 horse-power Westinghouse engines make up the power plant. The electric apparatus comprises two 125-volt, 125 kilowatt generators for operating the draw bridges and turn tables, one 220-volt, 62-kilowatt generator for the electric elevators, one $7\frac{1}{2}$ kilowatt generator to charge the storage batteries for the switches and signals, and two alternating machines for supplying lights at distant points.

A bill to allow cities to furnish electric current for heating has been passed by the Massachusetts House of Representatives.

STEAM AND HOT WATER.

Convention of Master Fitters.

In last week's *Metal Worker* we presented nearly the complete report of the convention of the Master Steam and Hot Water Fitters of the United States. At the time of going to press, however, they were in final session. We present below a note of what was done at the close.

The convention met in executive session shortly after 3 o'clock Friday afternoon, but about 4 o'clock went into open session. It was announced that arrangements had been made for a meeting on July 18 next between a committee of manufacturers of valves and flanges and the chairman of the Committee on Standard Flanges. At this session A. B. Franklin of Boston read a paper on the value of the National Association. A paper was likewise presented by John B. Farnsworth, entitled "Early Reminiscences in Hot Water Heating."

Appropriate resolutions upon the deaths of the following members of the association were adopted, and it was ordered that engrossed copies be sent to the families of the deceased: Herman Kroeschell, Chicago; Hazen Mooers, Milwaukee; J. Lincoln, Jr., Chicago; G. W. Strong, Joliet; William Costello, South Boston.

The convention then adjourned to meet at 9 o'clock Saturday morning, but at this final session nothing was done except that a formal adjournment was taken until the next annual convention.

Types of Heating Boilers in the United States.*

BY ARTHUR C. WALWORTH.

It is not within the scope of a paper of this character and length to enter into history to any great extent, yet it will not be amiss to take a glance backward and notice the development and separation of the several types of heating boilers in use to-day.

In the first half of the century there were few boilers in use for heating purposes only; most of the boilers used for power were of the long two-flue variety, with occasionally a hog nose, a marine or a locomotive boiler, and where steam was used for heating mills, &c., as it sometimes was through large cast iron pipes, it was taken from such boilers. There were, however, a few Perkins coil boilers in use in dwelling houses, which had been introduced by Walworth & Nason between 1840 and 1850, some of which are still in use, and whose type is preserved in the Baker car heater, and there were also some English saddle boilers used in greenhouses, connected to 4-inch cast iron hot water pipes.

AMERICAN INNOVATIONS.

To an increasing demand for steam and water heating, the inventive American mind was quick to respond with improvements and extensions of these primitive appliances: the multitubular horizontal boiler displaced the old two-flue boiler, cast iron was introduced as a material for low pressure boilers, the sectional principle was made prominent as an element of safety, and the thousand and one useful appliances and attachments were devised, so that the approved heating boiler of to day is not only a thing of beauty but an admirable and ingenious piece of mechanism, adapted, so far as human ingenuity can devise, to the peculiar and exacting demands which are constantly made upon it by people who seem to ask nothing short of a thinking and a reasoning automaton.

The system of heating water in a coiled pipe was an attractive one to inventors, and for the last 40 years we find that pipes have been bent and coiled and stacked over, under and around fire boxes in every conceivable manner; box coils, trombones, spirals, gridirons, bird cages and many other forms have been tried; some have worked well and some ill, but those that survive are of the simpler type, the more complex ones having been cast aside, both on account of the mechanical difficulties of their construction and their obstruction to free circulation. For boilers where compression into the smallest bulk is essential or very high pressures are required, this type stands at the head as represented today by the Roberts, Almy or Herreshoff boiler. For steam heating apparatus such boilers are not so often required; but for hot water circulators they have a wide field of usefulness from the large amount of surface which can be compressed into the space assigned to a house heater.

At this point it should be stated that since any steam boiler can be used as a hot water boiler, and any hot water boiler may be made a steam boiler by adding a steam drum, I have not separated steam and hot water boilers in the general classification, as that would be an artificial rather than a real distinction.

The use of coil boilers naturally led to the invention of the water tube boiler, which is simply a fire tube boiler with its elements reversed.

Walworth & Nason were making such boilers before 1849, with tubes standing at an angle of about 20° from the horizontal, whether of Mr. Nason's invention or adaptation I do not know.

This type of boiler proved strong and economical, although somewhat expensive, its leading representations to-day being the Babcock & Wilcox, Root, &c. The several makes of water tube boilers came to the front at the Philadelphia exposition of 1876, where careful tests were made of their evaporative capacity with very favorable results, and many of the best house heating boilers to-day are built upon their lines.

Horizontal water tubes suggested vertical water tubes, and this type to day is possibly the most popular for house heating boilers, of which there are many exemplars, both with open tubes and drop tubes, which will be considered later under their respective headings.

THE SADDLE BOILER.

One of the most prolific parent types was the English saddle boiler mentioned above: this was a welded wrought iron boiler, shaped like an inverted U or saddle, with a grate under it. This boiler was often used in greenhouses, and was so wasteful of fuel that a brick or tile flue was usually carried the whole length of the house under the cutting bench to utilize the waste heat. Our American boiler men substituted cast iron for wrought iron, closed in the ends, put a fire door in the front, and we had an old fashioned greenhouse boiler. This was still wasteful of fuel owing to its small fire surface, and improvements were made by using exteuded surface, corrugations or ribs on the inside, and also by adding internal smoke flues, down drafts, and other devices until this type of boiler has been made most useful for hot water apparatus not under head; these boilers I have classified as fire box tanks.

Another form of fire box tank was evolved from the tea kettle, by raising the fire up into the center of the kettle; to these again internal surface was added for the sake of economy either by extended surface as by Scollay, or by internal water boxes as by Weathered, or by a coil as by Mahony. This class of boiler is simple, cheap and useful for small dwellings, greenhouses, baptisteries, &c., and is often used in its simplest form of a ring of water around a fire pot, making what is usually called a fire box stove.

CAST IRON BOILERS.

From the water tube boiler was evolved in easy sequence the cast iron sectional safety boiler. In using a material like cast iron for a boiler it was evident that for purposes of safety each boiler must be subdivided into a series of small units. Geo. B. Brayton of Providence, R. I.—so he wrote to John H. Mills—made a cast iron sectional boiler, bolted together with faced joints, at Westerly, R. I., in 1849, but it was 1864 before the type was practically introduced, this boiler being apparently the pioneer of the numerous horizontal cast iron boilers with vertical strata. In 1859 Mr. Gold patented a boiler of this kind bound together with three string bolts. A suit brought by H. B. Smith & Co. against J. A. Ingalls & Co. (now Ingalls & Kendricken) throws some light on the history of this kind of string bolt boiler. The defendants were the successors of T. S. Clogston & Co., and were making the Clogston boiler, a cast iron string bolter. They proved in court that Joseph Nason was making in 1855 a cast iron boiler with short horizontal water tubes entering a vertical tube for each section, and the sections being united into a boiler by a string bolt through a water ring at the ends of the vertical tubes. They also proved from the French patent records that one Onesiphore Pecquer patented in France a boiler of this type in 1825. As a result they gained their suit, and the string bolt sectional boiler was open to the world.

Some time before this the Exeter Machine Works had bought Brayton's patterns and patents, and were making the so-called Exeter boiler, which still maintains its high reputation in this group.

In 1870 E. C. Clay of Boston devised a cast iron sectional boiler for dwellings and greenhouses, using instead of faced surfaces two horizontal drums to which the sections were connected by lock nut nipples, and it was at this time also that Mr. Mills was developing his boiler at Walworth's foundry at Cambridgeport, Mass. He also adopted the lock nut screwed connection after discarding the faced joint and the right and left nipple, being the first, I think, to use it in this kind of boiler. It proved popular and was adopted by the Exeter people, J. A. Ingalls & Co., H. B. Smith & Co. and others for large boilers of this type.

Sectional boilers with vertical sections readily suggested vertical boilers with horizontal sections, originating the cheese cake style of boiler, which has been made in such large numbers and seems to be the predominant type of small house boiler.

In 1874 the Canadians were using a great deal of hot water apparatus and importing many English boilers, and this naturally caused them to invent and build boilers of their own, which proved better than the imported ones. About this time Rogers & King of Montreal began to build the Spence, a square layer boiler named after the foreman. Mr. Gurney of Toronto, a stove founder of business capacity and ability, was the first to improve and push these buckwheat cake heaters as a commercial enterprise, and by combining a good heater with judicious advertising, he has placed thousands of them throughout the United States. They seem to be an evolution of the square Stafford and Spence heaters above mentioned. These pancake boilers are, like their horizontal cousins, either string bolted, like the Gurney, or nippled, like the New Winchester and Hub, and their name is legion.

* Presented at the New York Convention of the Master Steam and Hot Water Fitters' Association of the United States, June 19-21, 1894.

BOILER CATALOGUES.

Most makers of house boilers issue well gotten up circulars or pamphlets describing their boilers in detail. These are sometimes elaborate and handsome books with cuts of boilers, both assembled and detached. If complete they give tables of the data of the different sized boilers, such as number and size of tubes, outside dimensions of boiler, size of smoke pipe, tapping of outlets, square feet of grate and amount of boiler surface. Also a column of number of square feet of direct or indirect surface that the boiler is supposed to carry—that is, the rating of the boiler. In the competition of an open market this is inevitably high, as the maker must rate his boiler as his competitors do theirs—at what it can do and not at its duty under every day average and sometimes unfavorable conditions. The safest way for the heating engineer to determine the size he needs is to estimate the amount of water his apparatus will condense per hour, the only true gauge of its requirements, and allow 1 square foot of grate for every 60 pounds of water condensed per hour, which means a coal consumption of 6 to 8 pounds per hour. And for good economy I claim that a boiler should have not less than 35 square feet of boiler surface for each foot of grate surface, and this surface should be real and not nominal. The above ratings will give from 170 to 200 square feet of direct surface per square foot of grate, but for boilers of larger size this will be of course a larger figure, but depending invariably on the evaporative power of the boiler. I find that hot water boilers are more apt to be overrated than steam, as there is no standard temperature for hot water apparatus. I myself prefer a boiler that can carry the water to 212° or higher, and this means very nearly a steam rating, and in any case I do uot think a hot water boiler should be rated more than 25 or 30 per cent. higher than the same size used for steam, yet 50 per cent. is perhaps the more common practice.

BOILER CLASSIFICATION.

I submit herewith a classification of the various boilers and types. genera, species and sub-species, from which, if it were worth while, a table of analysis could be made from the appended boiler lists, so that a person finding a boiler without a name could aualyze it and bring it home to its maker in a few minutes. Of course some boilers are hard to place, as they are crosses between two species, like a mule, and my placing them in a certain catcgory may be questioncd, but I have arranged the boilers according to their salient points, and submit my lists as the first classification made so far as I am aware.

Analysis Table of Heating Boilers.

					Example.
The original tea kettle	Water subdivided..	Direct passages.....	Water tubes.....	Horizoutal.....	Ends of tubes closed.....Nason
					Ends of tubes open.....Root
				Vertical.....	Open tubes.....Mouat
					Drop tubes.....Furuan
			Cast iron, variform	Horizontal boilers....	Packed joints.....Gold
					Screwed joints.....Clogston
				Vertical.....	Packed joints.....Gurney
					Screwed joints.....Hub
		Serpeutine passages	Bent coils.....Baker heater		
			Coils made with fittings.....Garth		
	Smoke subdivided..	Horizontal tubular	Tubes in one series.....Allen		
			Tubes in several series.....Vogt		
		Vertical tubular....	Tubes in one series.....Regular		
			Tubes in several series.....G. K. Paul		
		Locomotive.....Monarch			
	Water and smoke massed.....	Single.....	Fire box tubes.....	Plain surface.....Crawford	
				Added surface.....Hitchings	
			Water stoves.....Little Giant		
		Complex.....	Concentric rings.....Pequot		
			Cylinders with loops.....Steads		

WATER TUBE BOILERS.

Taking the boilers in the order of the analysis we have, first, the horizontal water tube boilers. The high economy of these boilers arises from the large amount of surface that cau be placed in a given space by using a square or rectaugle instead of a circle, aud the element of safety becomes more important as modern engineering demands higher and higher initial pressures. For steam heating this point is not essential, but this kind of boiler has been adopted by the New York Heating Company for their central stations, where they supply steam for both heating and power. In all water tube boilers the weight of water is small in proportion to the duty ; and this is advantageous, or the contrary, according to conditions. The hight required for setting these boilers often forbids their use as heating boilers, where they must be placed in basements ; and their surfaces are not so easily kept clean as those of the ordinary tubular boiler, as it is evident that the inside of a tube is more easily brushed or blown clean thau the outside.

The vertical water tube boilers have the same advantages as the horizontal, with the additional one of not accumulating soot and ashes on their tubes by gravity. In order to be economical, however, some of these boilers, like the Firmenich, require a great hight to obtain a proper length of tube. The drop flue boilers seem to be the best adapted of the vertical water tubes for small heating apparatus, and iu the last few years this style has been adopted by many makers, some of them changing from other forms. They permit the concentration of a large amount of surface directly over the fire, and the tubes may be termed self cleaning, as an occasional brushing removes the few ashes that adhere to the vertical surface. The principle is au old one for steam boilers, and Mr. Nason made small house boilers on this plan before 1870. It has been claimed that drop flues will not circulate freely and will collect sediment. But practice shows that this objection is not valid. The Silsby Mfg. Compauy, who have made drop flue steam boilers for many years, write to the Bolton Heating Company that there is no tronble about rapid circulation, aud that the tubes ought to last 20 years or more in a house boiler. As the circulation will take lead shot out of the bottom of the tube there is no danger of sediment collecting, and the makers of the Button boiler tell me that they find the bottom of their loops actually polished on the inside by the rapid current. A disadvantage of these boilers is that they are not easily emptied of water, but this is an infrequeut demand, as heating boilers in summer should be filled to the safety valve rather than emptied.

CAST IRON BOILERS.

Next in order come the cast iron boilers. Cast iron is uot a material that commends itself to the mechauical engineer for boilers, since in them all strains are those of extension, which cast iron is comparatively weak to resist. American ingenuity has evolved notwithstanding, by the use of this material, a large class of boilers which have been especially successful for steam heating purposes where high pressures are not esseutial, while by subdividing spaces and using proper thickness of metal they are made safe against explosion and not especially liable to break down. The use of castings instead of sheet metal or tubes enables the maker to depart from rectilinear forms and employs every combiuation of curves, arches, spheres, bends and corrugations, resulting iu an almost infinite variety of detail, some good and some bad.

The horizontal boilers have been most popular for plants of 10 to 50 horse-power, and the vertical or smaller ones of 1 to 15 horse-power. The horizontal may be subdivided into the screwed connections and packed connections, either of which is good, if well made. These sectional boilers can be carried piecemeal iuto many places where a boiler in one piece could not be got; they also help out the heating engineer when he is short of length but has plenty of width. Almost all these boilers are short of steam space and liable to lift water if forced beyond their fair rating, but for hot water boilers they are especially useful, as their vertical circulation aids the circulation of the apparatus and their life is apparently longer than that of a wrought iron hot water boiler.

All boilers of this class need especial care in cleaning; they are full of corners and pockets where soot and ashes collect, and are with difficulty swept clean either with a brush or a steam jet. It may also be added that a freeze is sure destruction to any cast iron boiler.

Much of the above applies to the cheese cake cast iron boilers with horizontal sections. These boilers are usually provided with cleaning doors for spaces between layers, which must be constantly used, as each layer is a flat shelf for dust to collect upon. Fortunately by using numerous layers these boilers obtain a large amount of bottom and vertical surface, and do not depend on this shelf surface, which is apparently of little value unless swept every day.

Almost all these boilers would gain by using more sections, thus increasing the ratio of surface to grate but without increasing in proportion the cost of the boilers. Most of these boilers have water fire boxes, which is an essential point for a house boiler, as when a fire is covered up for the night and the drafts closed it gives out little heat, except radially in a horizontal direction. In order not to dull the fire at the edges they also have usually fire brick lining or alteruate fire brick and iron. Some of these boilers are without outside jackets of non-couducting material aud would be improved by such addition.

COIL BOILERS.

There are two conditions that lead an engineer to seek a coil boiler. One is where he needs a stroug, light, small and simple affair, aud cau use a circular or conical coil like a Baker heater, and the other is where he is assigned neither length, width, nor hight and must pack many hundred feet of boiler surface into a few cubic feet ; then he can use to advantage, as iu some office building where basement space is worth $100 a square foot, a boiler like the Perkins or Almy. Of course such boilers must have steam separating space and enough of it, or they will lift water with great facility ; neither cau they be used except with pure or purified water, as a small amount of scale wil destroy them. They are, however, economl ical of fuel and perfectly safe, being, as stated before, adaptable to the lightest pressures demanded in steam engineering. They should be run by an experienced fireman, with his eye on the water line, for the lower tubes once emptied they become red hot and bulge down iuto the fire box in a very few minutes.

TUBULAR AND OTHER BOILERS.

Next comes the old, reliable multitubular horizontal boiler, whose merits and weaknesses, whatever they are, are known to every engineer, and for all around heating plauts it is to-day the most popular boiler made and I thiuk justly so. It is of strong form, low cost, easily cleaned, easily repaired by any boiler maker, is loaded with no patent royalties, and when it blows up goes "all at once and no part first." I

Horizontal or Inclined Open Water Tubes.

Abendroth & Root	Root's	New York City.
Aeme Boiler & Radiator Co	Acme	St. Paul, Minn.
Babcock & Wilcox Co	Water Tube	New York City.
Chapman, H. M	Chapmau's Combine	Chicago.
Chicago Auto. Boiler Co	Chicago Auto	Chicago.
Campbell & Zell	Zell	Baltimore, Md.
Copper Manifold Water Feeder Co	Copper Manifold	Cleveland, O.
Cross, A. T	Saunders	Providence, R. I.
Eastman Steam Heating Co	Eastman	Roekland, Mass.
Electrie Boiler Co	Electric	Rochester, N. Y.
Gill, John L., Jr	Gill Patent	Philadelphia.
Harrisburg Boiler & Mfg. Co	Star	Harrisburg, Pa.
Hayes & Falls	Torrent	Roehester, N. Y.
Heine Safety Boiler Co	Heine	St. Louis, Mo.
Lewis Boiler Co	Lewis	Exeter, N. H., and Boston.
Lortie, F	Prefontaine	Granville, Wash. Co., N. Y.
National W. T. Boiler Co	National	New Brunswick, N. J.
Portsmouth Mach. Co	Carman's	Portsmouth, N. H.
Rutzler, E	Blake's	New York City.
Sawyer, N. F	Sawyer	Haverhill, Mass.
Schuylkill F'dry & Mach. Works	Wood's	Conshohocken, Pa.
Shaekleton	Shaekleton	Not now made.
Smith & Winehester	Winehester	Boston.
Steel, Geo. P., Iron Co	New Amer. Safety	Philadelphia.
Whitworth Heating Co	Whitworth	Worcester, Mass.

Vertical Water Tubes.

Anderson-Asire Co	Asire	South Bend, Ind.
Aultman & Taylor Mach. Co	Cahall	Mansfield, O.
Baker & Shevlin	B. & S.	Saratoga, N. Y.
Brake, A	Brake's	Toronto, Ont.
Culver, J. E	Thermostatie	Jersey City, N. J.
Duplex Safety Boiler Co	Duplex	New York City.
Finlayson, A. W	Finlayson	Detroit, Mieh.
Firmenich, J. G. & F	Firmenich	Buffalo, N. Y.
Fowle, A. H	Champion	Newark, N. J.
Head's Iron Foundry	Little Giant	Utiea, N. Y.
Herbert, M. E., Heater Co	Herbert Down Draft	Chieago, Ill.
Hopson & Chapin	Pequot Vertical	New London, Coun.
Ideal Heater Co	Phelp's Ideal	Oskaloosa, Iowa.
Malcolm, R. J	Malcolm's	Milwaukee, Wis.
Mouat Heater Works	Mouat	Detroit, Mich.
Otis Bros. & Co	Water Tube	New York City.
Peteler Furnaee Co	Peteler	Minneapolis, Minn.
Rice Engine & Boiler Co	Triumph	Chicago.
Richardson & Morgan Co	Cyelone	New York City.
Richmond Stove Co	Richmond Victor	Norwieh, Conn.
Silsby Mfg. Co	Comfort	Seneca Falls, N. Y.
Smith Patent Boiler Co	Smith Patent	Baltimore, Md.
Susquehanna S. Heater & Mfg. Co	Sperl	Susquehanna, Pa.
U. S. Heater Co	Capitol	Detroit, Mieh.
Walworth Mfg. Co	Howard	Boston.

Locomotive Type.

Bruee, F. E	Mehring	Chicago.
Fitzgibbons, P	Water Tube	Oswego, N. Y.
MeAleenan & Co	Monarch	Peoria, Ill.
Thatcher Furnace Co	Champion	Newark, N. J.

Tanks with Outside Loops.

At one time by Asheroft	Eeonomical	Boston.
Crane, Geo. A	Crane	Cleveland, O.
Central Falls S. H. Co	Ramsbottom	Central Falls, R. I.
Clonbrock Steam Boiler Works.	Morrin Climax	Brooklyn, N. Y.
Snyder, W. B	Snyder	New York City.
Stead, J. C	Spiral	Brooklyn, N. Y.

Vertical Fire Tubes.

Allen, D. N	Allen	Concord, N. H.
Allis, E. P	Reynolds	Milwaukee, Wis.
Baker, Smith & Co	Portable	New York City.
Barron Steam Heating Co	B—Perfection	New York City.
Barron Steam Heating Co	Ruskin, H. W	New York City.
Barron Steam Heating Co	Simplex	New York City.
Barron Steam Heating Co	Stanley, F. T	New York City.
Bates, E. P	Bates	New York and Syracuse.
Benjamin, J. C	His Own	Bridgeport, Conn.
Complete Combination Co	Post & Sawyer	Boston.
Connery, J. W	Connery	Philadelphia.
Davis, A. D	Davis	Colorado Springs, Col.
Denslow & Jackson	Combination	
Dunning, W. B	Dunning	Geneva, N. Y.
Duplex Steam Heater Co	Amerieun	New York City.
Ellis, C. R	Ellis	New York City.
Eureka Steam Heating Co	Eureka	Roehester, N. Y.
Ferguson Boiler Co	Ferguson	Albany, N. Y.
Frey & Motter	Surface Burner	York, Pa.
Globe Steam Heater Co	Globe	North Wales, Pa.
Gorton & Lidgerwood Co	Gorton	New York City.
Henderson, J. C., & Co	Henderson	Troy, N. Y.
Hobbs, Gordon & Co	Concord	Concord, N. H.
LeBosquet Bros	LeBosquet	Boston, Mass.
MeGinness, Smith & Co	Submerged Tubes	Pittsburgh, Pa.
Mitchell, John	Combustion Chamber	Louisville, Ky.
Mott, J. L., Iron Works	Demarest's	New York City.
Mt. Joy Steam Heating Co	Lindemuth	Mt. Joy, Pa.
Patterson, H., & Co	Amerieun Double	Albany, N. Y.
Pierce Steam Heating Co	Excelsior	Buffalo, N. Y.
Ranton Boiler Co	Ranton's	Syraeuse, N. Y.
Raymond Furnace Co	Raymond	New York City.
Rutzler, E	Nonpareil	New York City.
Silsby Mfg. Co	Silsby's Steel	Seneea Falls, N. Y.
Silsby Mfg. Co	Comfort	Seneea Falls, N. Y.
Swamscot Mach. Co	Swamseot	Boston, Mass.
Trimble & Lutz	Thermo	Wheeling, W. Va.
Utica Steam Gauge Co	Woods	Utica, N. Y.
Vail, S. S	Reversible	Keokuk, Iowa.
Vietor Heating Co	Vietor	Norwich, Conn.
Western Engine Co	Bronson	Painted Post, N. Y.

Horizontal Boilers with Vertical Sections, Screwed Connections.

Amerieun Boiler Co	Advance	New York City.
Amerieun Boiler Co	American	New York City.
Basshor, T. C., & Co	Lydie	Baltimore.
Boynton Furnaee Co	Boynton	New York City.
Combination Flue Boiler Co	Comb. Flue	Milwaukee, Wis.
Exeter Machine Works	Exeter	Exeter, N. H.
Foster, F. W	Improved	Boston, Mass.
Gates, E. N., Heating Co	Columbian	Fitchburg, Mass.
Gurney Heater Mfg. Co	Double Crown	Boston, Mass.
Hart & Crouse	Royal	Chieago, Ill.
Smith, H. B., Co	Gold's Improved	Westfield, Mass.
Smith, H. B., Co	I X L	Westfield, Mass.
Smith, H. B., Co	Mercer	Westfield, Mass.
Smith, H. B., Co	Mills	Westfield, Mass.
Smith, H. B., Co	O. K	Westfield, Mass.

Horizontal Fire Tubes.

Broomell Sehmidt	Our Own	York, Pa.
Devine, Peter	The Flat Top	Chieago.
McCormaek, J. H	McCormaek	Wallingford, Conn.
MeNeil, J. C	MeNeil	Akron, O.
Parmelee, E. S	Side Flue	Wallingford, Conn.
Standard Car Heating Co	Westinghouse	Pittsburgh, Pa.
Vogt, Henry, & Bros. Mfg. Co	Vogt's	Brooklyn, N. Y.
Worcester Steam Boiler Works.	Allen	Worcester, Mass.

Horizontal Water Bars in Strata.

American Boiler Co	Perfeet	New York City.
Carmody, J. D	New Idea	Evansville, Ind.
Geyser Heater Co	Geyser	Rochester, N. Y.
Majestic Mfg. Co	Majestie	St. Louis, Mo.
MeLain, J. H., Co	Cambridge	Canton, O.
Mott, J. L., Iron Works	Sunray	New York City.
Walker & Pratt Mf'g. Co	Commonwealth	Boston.
Wilber Heater Co	Wilber	Chicago.

Vertical Boilers with Horizontal Layers.

Abendroth Bros	Andrus	New York City.
Amerieun Boiler Co	Florida	New York City.
Amerieun Boiler Co	Soleil	New York City.
Amerieun Boiler Co	Spence	New York City.
Amerieun Boiler Co	Tropie	New York City.
Boyce, A	Boyce	St. Louis.
Browu, S. E., Heating Co	Blodgett	Chieago.
Clark, Ansel	Avery	Norwieh, Conn.
Columbian Construetion Co	Smith	Minneapolis, Minn.
Gates, E. N	New Hot Water	Fitchburg, Mass.
Gold, E. E., & Co	Pulsifer	New York City.
Ideal Boiler Co	Ideal	Chieago.
Lineoln H. W. & Steam Heat. Co	Superior	Central Falls, R. I.
Longard Bros	Longard	Halifax, N. S.
MeLain Co., J. H	Humber and Harvard	Canton, O.
Model Heating Co	Novelty	Philadelphia.
Mulford Heater Co	Mulford	Galva, Ill.
Page, Wm. H., Boiler Co	Volunteer	Norwieh, Conn.
Pease, J. F., Furnace Co	Pease	Syraeuse, N. Y.
Pulsifer, F. H	Auburn	Auburn, N. Y.
Putnam Foundry & Maeh. Co	Plummer	Putnam, Conn.
Redman & Byram	R. & B.	Fishkill Landing, N. Y.
Robb, John	Monareh.	Akron, O.
St. Louis H. W. Heating Co	St. Louis	St. Louis.
Smith & Anthony Stove Co	Hub	Boston.
Smith, H. B., Co	Globe	Westfield, Mass.
Steel, Geo. P., Iron Co	Monitor	Philadelphia.
Stover Heater Co	Cuba Vertical	Freeport, Ill.
Wheeler, Russell, & Son	Palace King	Utiea, N. Y.

Horizontal Tubes Closed at One End.

Althaus, F. D	Sectional	New York City.
Amerieun Heater Co	Amerieu	Beloit, Wis.
Bailey & Baldwin	Novelty	Pottstown, Pa.
Boynton Furnace Co	House Warmer	New York City.
Brown, R. F	Unique	Chieago.
Co-operative Foundry Co	Bermuda	Roehester, N. Y.
Hazleton Boiler Co	Porcupine	New York City.
Hedges, S. P	Hedges	Greenport, N. Y.
Holland & Thompson Mfg. Co	Holland	St. Paul, Minn.
King, H., & Son	King	Corry, Pa.
MeLain, J. H., Co	Cambridge	Canton, O.
Nason Mfg. Co	Free End	New York City.
Rohn & Ellieott	Rohn	Easton, Pa.
Vertieal Tube Boiler	Tube Boiler	Long Island City, N. Y.
Walworth Mfg. Co	Clay	Boston.
Wilson Boiler Co	Wilson	Buffalo, N. Y.

Perkins Type.

Almy Water Tube Boiler Co	Almy	Providenee, R. I.
Dimmick & Smith Mfg. Co	D. & S.	Wilkes-Barre, Pa.
Dueolin, S	Dueolin	Norwood, St. Lawrenee Co., N. Y.
Finlayson, A. W	Finlayson	Detroit, Mich.
Garth, Chas., & Co	Garth	Montreal, P. Q.
Gifford, S. J., & Co	Park	New Bedford.
McLellan, Chas. T	Little Wonder	Easton, Pa.
Roberts, Edward	Roberts	New York City.
Walworth Cons. & Supply Co	Perkins	Boston.

Concentric Rings.

Bell, Geo. H., & Co	Peerless	New York City.
Canton Mfg. Co	Columbia	Canton, O.
Herbert, M. E	Herbert	St. Joseph, Mo.
Haxton S. Heater Co	Haxton	Kenawee, Ill.
Hopson & Chapin Mfg. Co	Pequot Vertieal	New London, Conn.
Nolan, W. E	Nolan's	Brooklyn, N. Y.
Royal S. Heater Co	Royal	Gardner, Mass.
Rubel & Co	New Lily	Chieago.
Wheeler, Cyrus, Jr	Wheeler	Auburn, N. Y.

Fire Box Tanks.

Amerieun Boiler Co	Modern	New York City.
Brown, Rufus G	Brown	Waltham, Mass.
Caswell, F. K., & Co	Forced Cireulator	Hartford, Conn.
Combination Co	All Right	Norwieh, Conn.
Duplex Steam Heater Co	Duplex, Auto	New York City.
Ellis, Chas. R	Small Ellis	New York City.
Fish, Hindle	Smith & Lynch	Boston.
Gorton & Lidgerwood Co	Old Style Gorton	New York City.
Hay & Prentiee	Pattern L	Chieago, Ill.
Hitchings & Co	Corrugated	New York City.
Hitchings & Co	Vertieal B. B	New York City.
Leader, Putnam		Putnam, Conn.
Lovegrove & Co	Schimpf	Philadelphia.
Mahony, M	Direct	Troy, N. Y.
Mahony, M	Return Flue	Troy, N. Y.
March-Brownback Stove Co	Crown	Pottstown, Pa.

McDonald, K	McDonald	Portland, Maine.
New Haven Steam Heating Co.	Old Style	New Haven, Conn.
Pentecost Steam Heating Co	Pentecost	Worcester. Mass.
Putnam Foundry & Machine Co		Putnam, Conn.
Scollay, John A	Scollay, H. W	Brooklyn, N. Y.
Smith, H. B., Co	Cottage	Westfield, Mass.
Thayer Heater Co	Thayer	Wollaston, Mass.
U. S. Heater Co	Mascot	Detroit, Mich.
Vanderman, Wm	Vandermau	Willimantic, Conn.
Walker & Pratt Mfg. Co	Crauford	Boston.
Ware Auto. Heat Gen. & Reg. Co	Ware	Philadelphia.
Weathered, T. W	Weathered	New York City.

Gold Type.

Carr, E. T	Carr	Miles City, Mont.
Eureka Steam Heating Co	Plaxton	Rochester, N. Y.
Jewett, S. S., & Co	Expert	Buffalo, N. Y.
Smith, H. B., & Co	Gold	Westfield, Mass.
Steel, G. P. Iron Co	Excelsior	Philadelphia.
Stover Heater Co	Cuba Horizontal	Freeport, Ill.
U. S. Heater Co	Capitol, H. W	Detroit, Mich.
U. S. Heater Co	Hecla, Steam	Detroit, Mich.

Circular Coil Boilers.

Annin & Co	Moore's	Brooklyn, N. Y.
Auto. Safety B. & Eng. Co	Trowbridge	New Haven, Conn.
Baker, Smith & Co	Car Heater	New York City.
Brock, A. D	Brock's	Bostol.
Catchpole, A	Catchpole	Geneva, N. Y.
Clapp, M. R	Coiled Tube	Hudson, N. Y.
Gurnee, P. G	Gurnee	Kingston, N. Y.
Herreshoff Bros	Herrcshoff	Bristol, R. I.
Mahony, M	Mahony	Troy, N. Y.
McKay, Alex	Peter Smith	Detroit, Mich.
N. Y. S. Heater Co		New York City.
Portland Heater Co	Portland	Portland, Me.
Simmons, John	Burkhard	New York City.
Springfield Coil Boiler Co	Springfield	Springfield, Mass.
Tobey, Wm. L	Tobey	East Boston, Mass.
Union Brass Mfg. Co	Searle	Chicago.
Ward, Charles	Ward's	Charleston, W. Va.
Whitlock Coil Pipe Co	American, H. W	Elmwood, Conn.

Furnaces with Water Surface Supplementary.

Boynton Furnace Co	New Gas Light	New York City.
Brown, R. F	Water Heater	Chicago.
Denny Bros. & Co	McKay Comb	Newark, N. J.
Fuller & Warreu Co	F. & W	Troy, N. Y.
Hart & Crouse	Prince Royal	Utica, N. Y.
Howard Furnace Co	Combination	Syracuse, N. Y.
McDonald, T. A., & Co	Combination	New York City.
Norcross Damper Reg. Co	Combination	Boston.
Orr, Painter & Co	Torrid Suushine	Reading, Pa.
Pease, J. F., Furnace Co	Economy	Syracuse.
Russell, Daniel	Russell's	Boston.
Rutzler, E	Combination	New York City.
Simonds Mfg. Co	Culver	New York City.

Hot Water Stoves.

American Boiler Co	Little Giant	New York City.
American Boiler Co	Small Perfect	New York City.
Comb. Stove & Water Heating Co	Brewer	New York City.
Goulds & Caldwell Co	Caldwell	Chicago.
Hitchings & Co	Domestic	New York City.
Herendeen Mfg. Co	Furman, Jr	Geneva, N. Y.
Ingram, W. H	H. W. Stove	Philadelphia.
Kearns Wro't Steel Range Co	Kearns	Philadelphia.
Lynch & Woodward	Foxboro	Boston.
Mahony, M	Cooper, with coil	Troy, N. Y.
McLain, J. H., Co	Yale and Sandow	Canton, O.
Rex Heating Co	Rex	Norwich.
Rice Boiler & Engine Co	Triumph	Chicago.
Smith & Anthony	Water Stove	Boston.
Walker & Pratt Mfg. Co	Small Series	Boston.
Wilks, S., Mfg. Co	Wilks C. Stove	Chicago.

Drop Flue Boilers.

American Boiler Co	Bolton	New York City.
Button Boiler Co	Button	Waterford, N. Y.
Head's Iron Foundry	Standard	Utica, N. Y.
Herendeen Mfg. Co	Furman	Geneva, N. Y.
Johnson, F. T	Hartford	Hartford, Conn.
LeBosquet Brothers	New LeBosquet	Boston.
McLaughlin, G. T., & Co	Drop Tube	Boston.
Nason Mfg. Co	Equator, S	New York City.
Nasou Mfg. Co	Gulf Stream, H.W.	New York City.
Raymond & Campbell Mfg. Co	Sun	Middletown, Pa.
Remington Mach. Co	Remington	Wilmington, Del.
Soleau, E. R	Soleau's	Newark, N. J.
Windsor Heater Co	Windsor	Galena, Ill.

Unclassified.

Dover Fdry. & Mach. Co	Challenge	Dover, N. H.
Joy Steam Heating Co	Joy Stantou	Titusville, Pa.
Stanton, Henry	Harrison	Flushing, O.
Stanton, Henry	Galloway	Flushing, O.

do not think, however, that there is a case on record where such a boiler, being used for heating purposes and the main supply valve kept open, has exploded. With a properly proportioned apparatus you will find it very difficult to get up over 15 pounds steam pressure on the gauge, while with 80,000 pounds tensile strength steel a 48-inch boiler with ⅜-inch shell figures 1250 pounds per square inch bursting pressure, or using 5 for factor of safety 250 pounds, which would seem a safe margin beyond all peradventure.

The regular vertical tubular boiler is not much used as a heating boiler, one great objection being that its vertical tubes are not easily brushed either from the fire box or from the smoke bonnet; nor are such boilers economical, owing to the short length of tube that is submerged, usually only five-eighths of the whole length. They also have a very hot smoke bonnet when forced and have often set on fire the ceiling over them where it has not been fire proofed. This type has been modified, however, and, the above objections being removed, makes an excellent house boiler. Mr. LeBosquet obviated the latter objection by adding a superheating chamber over the tubes and under the bonnet, and J. K. Paul and others have added more surface by additional tubes with reversed draft and by other devices, so that the boiler has been made as economical as others of its class and cost. A very simple and fairly good boiler with vertical tubes is made by a plain cylinder full of tubes set on end on a brick fire box, and if brick setting is also used the outside skin of the boiler may be utilized for boiler surface; this boiler is hard to beat for low cost.

Locomotive boilers are not much used for steam heating. They are rather too expensive, for one thing. They are, however, a first-class boiler in a wood burning region, perhaps the best adapted to burning wood of any of the types. The writer has also used them in large dwelling houses in Maine and New Hampshire, setting the whole boiler under the heating stack and utilizing the outside as heating surface, the same as the Gold boiler is often used.

The fire box tank—that is, a fire box in the inside of a water box—is mostly used for greenhouse boilers where the head of water is only a few feet, as a cast iron box is not a safe thing to put internal pressure on. It is safe to say that these boilers are not economical unless additional heating surface is obtained by various devices, and the makers recognize this fact by making such additions, yet the best of them do not have a proper proportion of surface per square foot of grate. In their simplest form as a water stove they are very useful for laundries, stables, &c., but these little stoves can hardly be considered heating boilers.

The serious defect about all these boilers is that the main body is all one casting, and a small crack or defect when developed destroys the entire boiler.

There are two other types of boilers that should be mentioned before closing the list. One has alternate concentric rings of water and of smoke, and is really a vertical tubular boiler, the shell itself being one large tube and the other tubes being concentric inside it. If made of cast iron this would seem to be a weak form of construction, but will answer if shells are made thick enough. The other peculiar type is a vertical cylinder with surface added by water tubes leaving the cylinder and returning to it either by rectangles, by short loops or long coils. These boilers seem to reverse the usual principle of putting the fire inside the boiler and put the boiler inside the fire. To be economical it is evident that the outside must be very thoroughly insulated with a non-conducting covering.

BOILER ATTACHMENTS.

Leaving the boilers with this sketchy analysis, we should consider before closing their appendages and attachments. The most important of these is the grate.

A vast amount of ingenuity and invention has been expended upon the grates of the house heating boilers, and the manufacturers have profited by the experience of the furnace makers, which is often their own, and produced a large variety of oscillating, rocking, shaking, vibrating, dumping, revolving, and otherwise performing grates which would seem to leave little to be added in that direction. So, too, many boilers have clinker doors just above the grate, which are very useful. The makers universally furnish a water gauge and two or three gauge cocks, and usually a gauge cock box or water cock column, a steam gauge and a diaphragm regulator for controlling the draft, usually arranged to open and close dampers, both at ash pit and chimney, or to open and check draft in latter. For this top smoke connection I am inclined to think that a damper set by hand with a check draft operated by the automatic regulator the best combination. Hot water boilers do not carry with them an automatic regulator, but there are a number of good devices to be found in the market if demanded. A hot water boiler, however, is so different in its action from a steam boiler that it can be satisfactorily regulated without an automatic attachment.

A most marked improvement has been made in the last ten years in the external style and decoration of small boilers. As an example, ten years ago the Gurney was homely enough to scare a mule and its *confrères* were not much ahead of it in beauty. To-day, by the aid of tasteful pattern making, decorative handles, dampers and attachments and a little nickel plate and fresh paint, the house boiler captivates the purchaser at first sight, while artist and poet have been called in to ply their pencil and pen for the advertising literature of the enterprising makers. So have the dictionary and gazetteer been searched for catching appellatives for these childreu of American ingenuity, and captious must be the man or woman who, disregarding everything else, cannot find a name to suit them. A man can break himself with a Brake boiler or get broke with a Broke, or instead of a mother-in-law he can have a Torrent, a Geyser or a Cyclone in his house; so he can choose between the climates of the Equator, the Tropics, Bermuda, Cuba, Florida, the Gulf Stream or Hecla. If a sun worshiper he can select the Sun, the Sunray, the Soleil or the Torrid Sunshine. If a monarchist he can have a Majestic, a Monarch, or a Royal Palace King and Prince Royal, while an enthusiastic American can buy a National, American, Columbia or Commonwealth, while the sporty man can keep a Champion, Victor or Mascot in the house. At any rate, any one can have both Comfort and Perfection if he so wish.

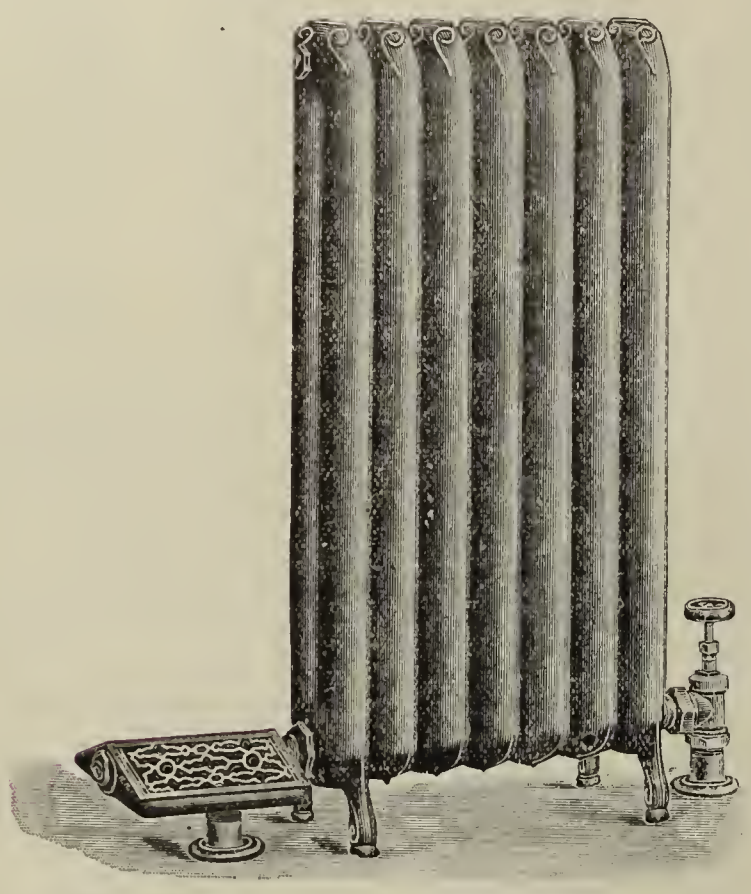
Leaving out the quotation marks this last statement is not far from true to-day, and the American house boiler takes its place by the side of those other necessities of our civilization, the harvester, the sewing machine and the typewriter, as the tribute of American brains to the comfort and convenience of our civilization.

"HEALTH and Comfort in the Home Circle" is the captivating title of a pamphlet just brought out by Thomas W. Weathered's Sons, 244 Canal street, New York. The pamphlet is of oblong shape bound in paper and in a prefatory note dated June, 1894, the company thank their patrons for the favors extended heretofore, and advise them that the Weathered boiler will always be reliable and that they will guarantee it to do all that is claimed for it. On opening the catalogue proper there are found illustrations, general and sectional, of the various boilers made by this well-known concern. First is the double dome, then come their No. 2 and 3 improved boilers. Later illustrations are given of the grates of the single dome boilers and of their self-feed hot water boilers; also their No. 2 combination laundry range. Other illustrations show the method of heating

water for baths, and accompanying the illustrations are given full descriptions and particulars. At the end of the pamphlet are presented a number of flattering testimonials.

The America Foot Warmer.

In the accompanying illustration we show the application of what is known as the America Foot Warmer to a steam or hot water radiator. The foot warmer is being introduced to the trade by the America Heating Company of Rockford, Ill., who state that the device is inexpensive, occupies but little space, is easily attached to a new or an old apparatus and may be connected to either end of a radiator. When used with a steam radiator having a single pipe system the warmer may be attached to the unconnected end, a stand resting on the



The America Foot Warmer Applied to a Radiator.

floor supporting the foot warmer from beneath. The goods are finished in several styles, including nickel plate, brass, copper or oxidized copper. The warmer measures 8½ inches in length and 9 inches in width. The engraving which we present herewith so clearly shows the device that extended description would seem to be unnecessary.

HEATING NOTES.

THE NOVELTY STEAM GENERATOR is set forth in a circular issued by the Model Heating Company, Philadelphia, Pa. A general view of the heater and views of the various sections and parts are shown in half tone engravings. A brief description of its chief features is presented, and some facts given of a test held May 29, according to which the boiler evaporated 13$\frac{3}{17}$ pounds of water per pound of coal. Another point made for the boiler is that with 800° of temperature in the fire chamber the smoke pipe showed but 190°. The trade will be interested in this apparatus.

APPLICATION has been made for a charter of incorporation for the McGinniss-Smith Company of Pittsburgh, which concern propose to manufacture and sell all kinds of steam, hot water and air heating apparatus and ventilating appliances. Wm. K. McGinniss, Robert S. Smith, Jno. A. Langdon and others are the incorporators. The new corporation will succeed the present firm of McGinniss, Smith & Co.

A WESTERN EDITION of their catalogue of Boynton's furnaces and heaters has been issued by the Boynton Furnace Company, 207 and 209 Water street, New York, and 195 and 197 Lake street, Chicago. This catalogue comprises 32 pages and treats of Boynton's patent hot water house warming heater, in 17 sizes, for burning hard or soft coal or wood; Boynton's patent cast iron low pressure steam heater, in 14 sizes, also for any kind of fuel; Boynton's new gas tight self-clearing hot air furnace, in five sizes, portable or brick set, for hard or soft coal, with cast iron return flue radiators and with heavy steel plate radiator; the New Climax furnace, for soft coal, in five sizes for brick work, and seven sizes portable; the new steel dome furnace, for either hard or soft coal or wood, in five sizes for brick work and seven sizes portable; the new steel dome return flue furnace with cast fire pot and cast radiator or brick lined fire pot and wrought radiator, for any kind of fuel, in three sizes for brick work and four sizes portable; the New Crusader furnace with heavy wrought radiator or cast iron radiator, for hard and soft coal, in four sizes for brick work and seven sizes portable; the New Niagara furnace with wrought or cast iron radiator, for hard and soft coal, in four sizes; the New Champion wood burning furnace, with 5-foot fire chambers, in four sizes; the Champion Extra wood burning furnace in three sizes; the new steel dome return flue furnace, with water heating combination, for hard or soft coal and easily adapted to wood, in three sizes for brick work and four sizes portable; the New Crusader furnace, with water heating combination, for hard or soft coal, in four sizes; Boynton's Superb fire place heater; Boynton's Baltimore fire place heater; the New Crusader room heater; the Fire King air circulating room heater; Boynton's Newport range in three sizes; the New Danube double oven range in two sizes; the New Lakewood double oven range, and Boynton's Niagara water heater for hard or soft coal or natural gas, in two sizes, for supplying hot water and heating conservatories, small dwellings, &c. The company have also issued a supplementary circular descriptive of their New Niagara low pressure steam boiler, furnished in three sizes.

THE BRIDGEPORT STEAM HEATING COMPANY, Bridgeport, Conn., have increased their capital stock from $10,000 to $20,000.

THE RICHMOND STOVE COMPANY, Norwich, Conn., display their usual good taste in the latest catalogue that we have received from them. It is a pamphlet 10 x 8 inches in size, held together by a silk ribbon. The contents are illustrations of the extensive line of Richmond heaters made by this concern, with the names and capacities of the heaters given in connection with the illustrations.

Cost of Electricity.

The *Electrical World* states that in referring recently to some English data on the cost of generating electrical energy in central stations the conclusion was drawn that 6 cents would probably more nearly represent, exclusive of capital charges, the cost per horse-power hour of generating current in the central stations of this country than 4 cents, the figure usually quoted. Commenting upon the report of the Massachusetts Board of Gas and Electric Light Commissioners for 1893, our contemporary says:

Extensive official data and information are given of all the central stations in that State, and while not in a form to be directly applicable to calculations on the entire cost of generating current, yet they will enable approximate results to be arrived at. Almost all of the companies in the State do both arc and incandescent lighting, and some also supply current for motors, which renders it difficult to fix on a rate which will represent the average cost at which electrical energy is sold. The charge for incandescent lighting is almost uniformly 1 cent per 16 c.-p. lamp hour, and it is probable that, as usual, where flat rates are given, they are based upon the same figure; assuming that the prices received for arc current are also based upon incandescent charges, we have 12 cents as the approximate price received per hourly horse-power. This figure would be too high for motor rates, but as that assumed for arc light charges is probably too low in many instances on account of the "scaling down" of current for public arcs, we may assume 12 cents per hourly horse-power as the average received for all electrical energy sold, which, however, will include carbons for arcs and trimming. In looking over the result of the operation of the various stations for the year ending June 30, 1893, we find that of 60 companies 26 did not declare any dividend and six did not earn expenses. Of the 28 companies which paid dividends, 19 paid from 6 to 8½ per cent., the remaining nine paying from 5 to 1 per cent. It will be thus seen that over half of the central stations of Massachusetts found no profit in operating, or, under our assumption, it cost them 12 cents or more to generate an electrical horse-power.

PLUMBING and GAS FITTING.

Philadelphia Trades School Commencement.

On Wednesday evening, June 20, the fourth annual commencement exercises of the Master Builders' Mechanical Trades School were held at the Master Builders' Exchange, Seventh street, Philadelphia. The exhibition rooms of the exchange were lighted up for the inspection of the visitors and the exterior of the building was tastefully decorated in honor of the occasion. The programme was simple, consisting of brief addresses by Franklin M. Harris, president of the exchange; George Watson, chairman of the Trades School Committee, and Stacy Reeves, representing the school. Director of Public Works James N. Windrim then addressed the students in an effective speech, in which he said that the time had now passed when America was compelled to draw upon England, France and Germany for their skilled artisans. The American youth, he said, have now learned how to work, which is the best capital for a young man. He has knowledge which cannot be lost in speculation, which will increase to the exact value the workman himself puts upon it. Therefore, he continued, every young artisan should set himself a high standard of excellence in his work. His aim should be to be the first in his chosen occupation, to be the best workman, to be a master workman. He rejoiced that the trades schools of America, under the guidance and teaching of skilled men, are providing workmen from our own people who will be able to compete with the highest skill of the nations of the world.

Following the addresses, the graduates of the several classes were presented with their certificates. The numbers graduating from the different classes were as follows:

Carpentry	14
Bricklaying	6
Stone cutting	2
Blacksmithing	2
Painting	3
Plumbing	19

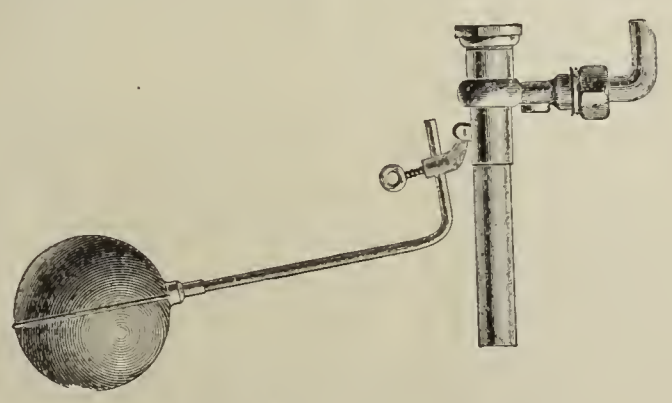
The following are the names of the students who graduated from the plumbing class:

George H. Broehnan.
Claude Ramsbacher, Jr.
William E. Daniell.
Ellis Swann.
Edmund A. A. Schneider.
Thomas Hushen.
James J. O'Hara.
Edmund J. Reidel.
John W. Butler.
George Worrell.
S. J. McCandless.
James S. Ferguson.
John J. Schwartz.
John M. Stemmer.
George W. Duffy.
Thomas J. Malarkey.
Lawrence Hatch.
Samuel E. Draves.
William A. Roberts.

Of these graduates, George H. Broehnan and Claude Ramsbacher, Jr., received prizes of $10 each for special proficiency. The school will commence its fifth session in the fall, when a large attendance of pupils is assured. Its success so far has been remarkable. Graduates from the various branches of trade taught have almost without exception obtained remunerative positions, in which they have done great credit to the training received in the trades school.

McHugh Quick Acting Ball Cock.

The accompanying engraving represents the McHugh quick acting ball cock, recently patented, manufactured by T. J. HcHugh, 292 Washington street, Boston, Mass. The device is made of best material and so constructed as to admit a free flow of water when open and to close quickly and tightly by the action of the ball. It gives a full supply until the tank is filled and shuts off, without dribbling or hammering. The manufacturer states that there is no packing to wear out or dry up when water is shut off.



McHugh Quick Acting Ball Cock.

The Knights Initiate.

The Knights of Tabasco assembled in the "ordinary" of the Cadillac on Thursday afternoon to perform their initiating ceremonies. In view of the large number of new members, nearly 100, the following were selected to be initiated in the presence of the rest: Samuel Clark, A. C. Whitney, W. J. B. Lee, J. H. Hamilton, C. H. Meckenbirn and Frank K. Chew of *The Metal Worker* staff.

While the Knights were working on the first candidate, the others, by courtesy of a chambermaid, were released from their confinement in an adjacent room and entered the sanctorum wearing Ideal water closet seats around their necks for regalia. They were quickly secured, ordered to be killed, and confined under guard. The sentence of death was afterward commuted by "Old Pepper" Cushing to an initiation of unparalleled severity, and the good work went on. The "hot stuff" applied approached the temperature of the furnace through which Daniel passed, and every man came out a genuine "hot stuff." "Red and White Pepper" (the secretary) then reported $100 in the "pepper pot" (treasury). Judge C. B. Ernst was then elected attorney extraordinary and counselor plenipotentiary, his salary to be drawn from his own bank account. Resolutions of thanks were adopted to the Hotel Cadillac for the courtesies received; to A. G. Alexander for his splendid entertainment and to the National Association of Master Plumbers for the honors conferred. "Young Pepper" D. M. Davidson and "Pepper" F. W. Herendeen were appointed a committee to send to each copies of the resolutions. The meeting then adjourned and the Knights dispersed, singing one of their quaint songs. This unique organization will be heard from in greater strength than ever at Philadelphia next year.

Detroit Manufacturers.

The manufacture of goods that are used by plumbers is an industry in Detroit, Mich., in which a large number of people are employed. A few of those on whom a call was made during the convention are given below.

THE PARK & MCKAY COMPANY make a specialty of plumbers' supplies and manufacture a number of specialties, their Utopia siphon water closet being one of their leaders.

THE DETROIT LEAD PIPE & SHEET LEAD WORKS, Detroit, manufacture all weights and sizes of lead and tin pipe and sheet lead. In addition they handle a full line of wrought iron pipe and valves and fittings. They also carry plumbers' tools and supplies and are adding a number of specialties that will interest the plumbers.

THE DETROIT SANITARY SUPPLY COMPANY, Detroit, Mich., are sending out a neat catalogue of their Clean Sweep non-siphon trap in brass, vented and unvented, in all of the various shapes required for sinks, lavatories, baths and urinals. The same variety is made in lead cast in one piece. They also make a large line of Clean Sweep bath and basin waste and overflow and supply pipes with air chambers. They also make a combined basin overflow and plug combined. Goods made to measurement are one of the features of their business.

BIRCK & SHERWOOD MFG. COMPANY are well known to the trade through their Success seats and tanks for water closets. Their buildings are on the corner of Champlain and Meldrum streets, and form three sides of a square fronting 200 feet on Champlain street and running back 140 feet, with an average width of 50 feet. Inside the square is

their iron and brass foundry, where everything from the hinges for the seats to the brackets for the tanks are made and a line of plunger water closets. Their wood working department occupies the main buildings, with their brass finishing shop. Here is their sheet metal shop, and 300 flush tanks a day, all finished complete, varnished and ready for shipment, gives some idea of their capacity for manufacturing, and seats are turned out with the same rapidity. The quality of their goods is their pride, and nothing inferior in grade is permitted to be shipped. During the convention a lunch was served to the visiting ladies, and afterward a photograph was taken of the ladies arranged on a specially built platform in front of their factory. All of the ladies left their address and will receive pictures later. The Knights of Tabasco also were entertained, and enlivened their visit with recitations and songs. Many of the delegates found time also to visit this hospitable house.

Sales Bros. are a popular house with the local plumbers who need steam fitters' supplies and soil pipe.

The Ideal Mfg. Company, who furnished a reserved seat for all at the Cadillac, have a plant occupying a front of 350 feet in Dubois street and 230 feet on Franklin. Their wood working shops where the Ideal closet seats, flush tanks and bath rims are made, are so arranged that the lumber passes from hand to hand without resting till it reaches the storeroom with a finish like a fine piano. This wood work is protected by a varnish that is so durable that it is said the seats may be suspended in boiling water for 60 seconds without opening a joint. They have an iron foundry with a capacity of 20 tons of iron per day, where they make all their brackets and cast iron goods and steam and hot water boilers for two of their customers. Their core oven is heated by a gasoline burner made by the Union Heater Supply Company and they are much pleased with its economy and efficiency. Their foundry is fitted up with a railway crane that can be used on any floor in the shop. They have a brass foundry where their brass work and the Ideal hot water and steam valves are made. Their engine room is kept in exhibition condition by their master mechanic who runs the plant which furnishes electricity for their lighting and the motors for the various machinery in their plant.

The Union Heater Supply Company make a specialty of gasoline goods. A plumbers' or painters' torch is one of their new things that presents advantages and can be moved quickly without danger of its going out. They make a furnace for melting brass, in which 4 pounds of brass can be melted in ten minutes ; and as it is small, it is adapted for use in pattern and machine shops. Their first catalogue is being prepared and will contain many excellent articles, one of which is a tailors' goose, the heat of which can be nicely regulated.

Samuel Dickson, 79 East Congress street, has a sample room fitted up with plumbing goods that is calculated to make the Detroit property holder wish for similar fixtures in his buildings. Enameled baths, handsome lavatories and a variety of water closets are set for inspection just as they would be in use.

Bowerman & Allen, 141 West Larned street, Detroit, have a number of attractive specialties which they showed to the visiting plumbers.

Method of House Drainage, Disposal of Waste and Ventilation.*

The subject of house drainage has, since a remote day, been the study of not ouly the master plumbers, but of scientists, architects, engineers and a host of others, resulting in many divergent opinions of more or less practical utility, but of as yet no perfect system meeting fully the great and ever increasing demands which its importance requires.

To the masters plumbers, equally as much or perhaps to a greater extent, is due a large share of the present excellence of our system now in vogue, and probably it is safe to say that nowhere in our broad land has it been exceeded in its present state of perfection than in the "heart of the commonwealth of Massachusetts." Let us for this then give thanks to the master plumber whose earnest endeavors have carried the good work onward in spite of short-sighted opposition which he has met upon every hand ; opposition coming from those whose efforts should have been directed in assisting rather than iu opposing.

But to-day, as a triumph to the master plumber, these same parties are being brought to realize that the master plumber is a power, a factor toward the accomplishment of a perfect whole, and he is beginniug to receive his due The difficulty of covering so broad a field as the subject demands iu so confined a space as this article is, of course, appreciated, but a few words denoting the progress of sanitary house drainage as at present being introduced here may be of interest.

METHODS OF SEWAGE DISPOSAL.

A city of nearly 100,000 inhabitants must of necessity have a very good, bad or indifferent method of sewage disposal. Worcester is especially favored in the former respect, thanks to our far-seeing city fathers, who have designed, planned and executed one of the fiuest systems in the couutry. The final disposal of the same is, however, still a disputed question, the method of chemical treatment, resulting iu a deposit of solid matter in settling basins, having been introduced at an outlay of thousands of dollars and which is to a certain extent satisfactory for present needs. So much for the taking away and disposal of sewerage. Now for that which interests and affects more vitally the master plumbers.

From an early beginning of cement pipe with open joints and foul odors, with small S traps being constantly siphoned, from no ventilation, and disease spreading water closets, we have a highly improved and almost perfect system of ventilation, the latest sanitary improvements of water closet, lavatory and bath, opeu and uninclosed, affording no opportunity for the accumulation of disease germs or infectious surrounding of rotting wood work. A brief sketch of the arrangements in use here may perhaps be of interest.

While similar in many respects to those which obtain in other citics, it has possibly some features which are local in their application. Beginning with the connection with the sewer, an extensiou of 10 feet through the cellar wall is first made, properly connected at its outer end with a connecting cement or vitrified pipe to the sewer proper ; this connection being made by a liceused sewer layer, under the direction and superintendence of an engineer furnished by the city. Inside the cellar wall is placed a running iron trap, having ou its outer or sewer side a brass clean out, and on its inner or house side a 4-inch iron inlet extending through the outer wall for the admission of fresh air, said air being drawn in by natural circulation caused by the main iron soil pipe receiving the house sewerage being extended to and through the roof of the building. From the above trap the main soil pipe is extended across or through the building to points under the fixtures, either above or below ground as the case may be, and thence carried up and through roof as above stated. All irou soil pipe used below ground is extra heavy. Traps of fixtures are back aired. Back air pipes are in size not less thau 2 inches and are carried through roof by being increased 4 inches, or may be connected into main soil pipe before placing through roof. The fresh air drawn in at the fresh air inlet before mentioned is constantly circulated through this system of piping, insuring a perfect ventilation and rendering void any danger from escape of gas should an unknown break or defect occur in any part of drainage pipe. After the soil pipe has been put in place it is given a water test under the superintendence of the inspector of plumbing.

LOCAL VENTILATION FROM WATER CLOSETS.

The above gives an outline of our drainage arrangements. Another feature to which especial attention is given is the local ventilation from water closets. All water closets are required to have a special ventilating pipe of either galvanized iron, cast iron or copper running into a heated flue, insuring the carrying away of all foul odors from the closet above the trap. This plan has been successful to a greater or less extent, depending on the distance from the heated flue, number of angles, point of entering flue, &c. It is intended to adopt a new clause in our ordiuance demandiug that a special brick flue shall be constructed on one side of the house chimney in use for kitchen purposes, but having no connection whatever with said kitchen flue. This flue beiug constantly warmed by the adjoining chimney has a strong upward draft. Into this flue all local ventilation pipes are entered, of size not less than 2 inches in diameter. No two or more pipes are allowed to be counected, but each must enter separately and independently of each other. Formerly several closets were connected to the same ventilating pipe, said pipe being increased according to the number of closets, and the main pipe finally entering the smoke flue of the kitchen chimney under the roof. It was, however, found that in this case the least draft was at the point of entrauce, and the ventilation practically a dead letter.

STYLE OF CLOSET EMPLOYED.

When the iutended changes in our ordinance are in working order, it is safe to say that our buildings will be as free from foul odors as it is possible to make them. Regarding the style of closets in use for the better class of work, the siphon has nearly superseded the old style wash out, so many of which were used but a few years since, their defects having driven them from use. The siphon, with its large water seal, freedom from noise and strong action, has recommended itself favorably and is practically satisfactory. Short hoppers and combined hoppers and traps fill the requirements for a cheaper class of work, and although of course not as satisfactory as the siphon, are sanitary and fill the conditions required. The above system will in all probability be introduced into our public schools, the requirements being of such great importance in the question of pure air and freedom from disease among the thousands of children attending our schools. We consider that the principle of a plumbing fixture of any kind is that at once upon its use the foul matter which it contains should be immediately, entirely and effectually carried away. To accomplish this a perfect design of flushing from an adequate supply of water and au equally perfect system of drainage and ventilation are indispensable, and we are proud to claim that our methods have practically accomplished this. Yet we do not stop here. We are continually studying, experimenting and discussing new iuventions and improvements and endeavoring to make the plumbing of our city secoud to none in the country. Our Master Plumbers' Association is furthering the good work by every means in its power. We are alive. We are endeavoring to make our mark, not only for ourselves and the public, but for the good of every association of master plumbers throughout the land, thereby strengthening our National Association, giving it a truly national reputation, that every oue of us who are its members may hold up his head with pride and say, I am a member of the National Associatiou of Master Plumbers.

*Essay prepared by the Sanitary Committee of the Master Plumbers' Association of Worcester, Mass., and presented at the Detroit convention of the National Association of Master Plumbers, June 19-21, 1894.

At a recent Irish Trades Congress a resolution was passed urging upon the local authorities in Ireland the desirability of electing practical plumbers to the positions of sanitary and water inspectors. This class of work had been, it was asserted, largely carried out by unskilled and unqualified men. In Glasgow, Bradford, Liverpool and Manchester the inspectors are all plumbers, and several plumbers are acting as inspectors at Belfast, Ireland, with the best results.

The Business End of Plumbing.*

BY C. C. DEWSTOE.

As a mechanical art the plumbing trade has kept pace with the progress and development of the age. As an important branch of the building art it has done more. In its adaptation to the requirements of a perfect house what other branch of building has shown such development? Masonry is substantially the same as it has always been. Carpentry, except for a little more niceness of finish and detail, shows no special improvement. The same may be said of plastering and painting. But contrast the plumbing of a generation ago with that of the building of to-day. Modern plumbing, with its beautiful fixtures, scientifically accurate piping for drainage, ventilation and water supply, involving in a high degree the principles of mechanical and sanitary engineering, not only performs a function of the highest use and convenience to the house, but marks an epoch in the progress of civilization and refinement. It is not necessary to dwell upon this aspect of our business to men who have aided in its development and perfection, nor is it the theme of this essay to enlarge upon the excellence of plumbing as an art, but rather to inquire why a business showing such progress and improvement, both in quality and quantity, should show up so poorly as a money maker.

That, upon a broad scale, the business of plumbing is not financially successful can easily be demonstrated, if demonstration were required. Look over the records of the mercantile agencies and examine the ratings, if you can find them, of the master plumbers of the country. Ask the banks how they are rated as depositors or customers. Ask the jobbers with how much confidence they establish or increase lines of credit.

True, our friends the newspapers credit us with enormous gains. They crack their jokes, not always fresh or witty, about our diamonds, and oh, how they expatiate upon our hills.

If we could get and hold a fraction of the profits they credit us with we could well afford to smile at their extravagance and could almost forgive them for the universal suspicion their never ending jokes have thrown upon our business.

ENTITLED TO FAIR PROFITS.

I take it that no elaborate argument is needed to show that the plumbing business is entitled to as profitable remuneration as any other of equal magnitude and importance. The only question to discuss is, How shall we get it? The plain answer would seem to be to secure a reasonable profit on all the materials and labor. But this is by no means as easy to do as to state. To conduct a plumbing business successfully and profitably requires higher qualifications and greater business ability than to conduct a purely mercantile business. The merchant buys his goods at the lowest price he can obtain. He marks them at such an advance as will cover upon an average business his expense of living and management and leave a profit. If he sells his goods he makes his profit. There is little or no uncertainty about it. The plumber also buys his goods. But how does he sell them? He must fix the price when he figures his job that he is willing to take for his goods at periods all the way from three months to three years from the time he fixes his prices. He cannot accurately fix the quantity he must furnish, for plans are rarely explicit and clear enough to enable the most experienced to estimate exactly the quantity he must furnish. Further, he must look forward to the time of executing his contract and fix accurately (or suffer for it) the amount and cost of the labor required to complete the sale of his goods.

In addition to these qualifications he must possess the mechanical ability to execute or superintend and lay out the execution of the work itself. Are not these higher qualities than are demanded in the mere buying and selling of merchandise?

And, unfortunately, is it not true that the difficulty of our trade arises from the fact that a large number of its members do not possess these qualifications? They are good workmen. They possess the mechanical qualifications in a high degree, but the other quite as important business qualifications are in too many cases lacking.

It is not to their discredit, but on the contrary immensely to their credit, that journeymen are ambitious to become masters. But are they not apt to overestimate the value of purely mechanical and underestimate the value of the other qualifications required in the management of business?

NEED OF COMMERCIAL ABILITY.

To know how to do the work is a valuable acquirement, but to know how to make the work pay seems to me quite as important, but it is a lesson the best practical man on earth must learn before he can make a success of the business. To make the plumbing business pay there is but one way. To make money out of a job by skinning it, by evading the requirements of good sanitary work and taking advantage of ignorance of architect or customers, will not commend itself to members of the Master Plumbers' Association, nor would they patiently listen to its suggestion. There is but one other way, and that is to weigh carefully the cost of contracts, both material and labor; to estimate carefully what may be called the incidents of the job that may go against you, and to add over all a profit that after allowing for expenses and living will leave a little for a rainy day.

How shall we accomplish this desirable end? It seems to me that it is pre-eminently the field for association work. It must to be successful spring from unity of action. The slow horse fixes the gait for the profession, and the low man largely fixes the rate for contract work.

A better price on contract work would remedy another evil of the trade, and that is the high price charged for day work and extras, and the wrangling, kicking, delay in settlements and general ill feeling resulting. It is hardly to be wondered at or greatly to be blamed if a plumber, feeling that his contracts are paying him nothing, or next to nothing, should seek to recover on work not covered by contract, but much the better and more honorable way to insist upon such a reasonable profit upon contracts that extras and day work could be executed upon substantially the same basis.

The world has not much use for, and does not long regret, the man who all his life works cheap and "lets the town bury him" It does respect the man who insists on a fair profit, who pays his bills, who lives decently, who takes a proper place in the business world and asserts himself as a man, and above all, such a man can respect himself.

Echoes of the Plumbers' Convention.

UNUSUAL INTEREST was taken in the election of officers this year. More than one section had its favorite candidate, whose claims were zealously pressed in every direction from the opening of the convention. A hot contest was therefore expected, but, as has been said of some other matters, in this respect everybody's most sanguine expectations were exceeded. It was the hottest fight ever seen in a convention of the National Association. It was any body's chance until the last ballot. Yet the strength of each candidate was pretty accurately measured by some careful observers before the first ballot was taken. The most remarkable estimate made was that of Paul Redeiske and Alex. W. Murray of Chicago. They estimated within one of Mitchell's vote, and varied only two or three from the votes given to the other candidates. As it was a large convention (309 votes on the first ballot) and there were four strong candidates in the field, it is believed that the guess made in this case was unprecedentedly close.

THE EXCURSION to the Oakland House on Friday was an event. The work of the convention was over, all cares were dismissed from the delegates' minds and they were prepared to enjoy a day's pleasure to the utmost. And it was a pleasant day. The sun shone hot, but the excursion was a trip on the water, and the hotter the weather the better at such a time. The steamer "Pleasure" left the city at 8.45 in the morning with over 1000 persons on board, passed up the Detroit River, through Lake St. Clair, past the St. Clair Flats, with shooting and boating club houses on every hand, into the St. Clair River, and finally brought up at the Oakland House at St. Clair mineral springs at 1.20. Here the passengers debarked and partook of a fish dinner, after which they scattered over the broad porches, haunted shady nooks on the lawn or "tripped the light fantastic" in one of the hotel's spacious parlors. The Knights of Tabasco seized the opportunity to give a few candidates for knighthood a public initiation, which was perhaps enjoyed more by the spectators than by the neophytes. At 4.15 the return trip was begun. Refreshments suitable for a hot day were served lavishly, dancing proceeded on the upper decks with very slight intermissions and everywhere songs were heard with great crowds joining in the choruses. The city was reached at twilight, and the excursionists separated to their hotels with enthusiastic praises of the aquatic and scenic surroundings of Detroit and thanks to the Detroit local committee for their magnificent entertainment.

A PLEASANT FEATURE of the convention, serving greatly to brighten its appearance, was the presentation of a *boutonniere* every morning to every one of the delegates. It was very thoughtful on the part of the local committee, and the favor was highly appreciated by all of the delegates.

THE RETIRING PRESIDENT, Daniel G. Finnerty, and the retiring secretary, David Smith, have the thanks of *The Metal Worker* for their unvarying courtesy. At no time was either the president or the secretary inaccessible or unapproachable. With a multitude of cares on their shoulders and harassed by all sorts of vexations, they might easily have been excused for an occasioual failure to respond to a request for some piece of information. But this never happened. They were always genial and obliging. But then how could they be otherwise? They are both Bostonians and both very old subscribers to *The Metal Worker*.

WILLIAM E. CROSBY, whose name does not appear in the list of officers of the association, nevertheless fills an important official function. He is known to the officers and members as executive clerk, has served in that capacity for several years past, and will probably continue to do so for an indefinite period. His is a position which survives changes of administration, and wisely. It is necessary to have some one man to keep the run of the business of this great association, so that the details may slip along smoothly and without friction, leaving the officers free to consider the greater matters of policy for the conduct and maintenance of which the association was founded.

AT THE REQUEST of the delegates who were detained in the convention the Knights of Tabasco on Wednesday afternoon escorted the ladies to the steamer "Sappho," where the delegates found every lady provided with a good seat and delighted with the courtesy of the Knights. At 5 p.m. they proceeded across the Detroit River to the "Ben Hur" farm at Walkerville, Ont., where A. J. Alexander tendered a more sumptuous and delicious repast than any banquet, and served in an orchard; the surroundings were quite novel and romantic. The tables were laden bountifully with both the delicacies and the substantials. Native wines were furnished without stint and claret punch and lemonade for the ladies. After all had been served strolls about the farm were enjoyed. On the sound of the whistle of the steamer for the return the Knights of Tabasco seated host Alexander in a chair and with song carried him to the steamer, making a very happy feature of the occasion. The return trip was enlivened by music by the orchestra, enchanting songs by the Knights, and the only Kelly, Thomas F., entertained all by an exhibition of dancing that for grace and variety of steps surpassed anything seen on the street of Cairo. At 9.30 p.m. the guests departed to their hotels with feelings of warmest enthusiasm over their entertainment, and the Detroit Association as well as Mr. Alexander will long be remembered for their hospitality.

EDWARD H. FOX of Chicago, the Western agent of the Phœuix Glass Company, Pittsburgh, Pa., made a handsome display in Parlor S, Hotel Cadillac, of gas and electric light globes in various colors, shapes and styles of ornamentation.

IN APPRECIATION of the untiring efforts of John Yule to provide a full delegation from New York, to insure comfortable transportation, ample refreshments and

* Essay presented at the Detroit convention of National Association of Master Plumbers, June 19-21, 1894.

satisfactory seating on the West Shore train, a party of conspirators started a fund with the intention of presenting him with some token of their appreciation. Samuel L. Malcolm, William C. Young and Philip Smith, the committee, secured a handsome Etruscan gold heart locket. One side bordered with a scroll design was set with three diamonds, the other bore this inscription: "John Yule, from New York Delegation M. P. A., Detroit, 1894." At a meeting of the delegation the token was presented by Samuel L. Malcolm with a cordial speech and received by Mr. Yule with such remarks as showed the heart he received was of no truer metal than the one he has always worn.

THE MICHIGAN STATE ASSOCIATION OF MASTER PLUMBERS is a live organization and is laying out some work that will be for the good of all when completed. James Meathe of Detroit and Colonel Wheeler of Kalamazoo are shaping matters to introduce a new law in the next session of the legislature similar to the Massachusetts law printed in *The Metal Worker*, June 16.

BOWERMAN & ALLEN, Detroit, circulated a little blue covered pamphlet of their Unique water closet, giving "four reasons why" all should buy it. On the first cover page they say: "You pull the chain, we do the rest." This should be attractive in some cases.

MARK E. MONASH of the Van Auken Steam Specialty Company, Chicago, pointed to their patent deflecting shield seen on all the raidators in the hotel.

THE PICTURE of "Uncle Josh," circulated by the Park & McKay Company, Detroit, will make their Utopia water closets and seats and cisterns long remembered by all who saw them.

M. T. WHITNEY represented the Raymond Lead Company of Chicago. Yet the weight of his goods neither depressed him nor the many who are glad that they met him.

AS THE PARADE FORMED in front of the Cadillac every plumber and knight was presented with a hard rubber match safe, bearing a horseshoe with the words "Capital Luck" on it, the trade-mark of the United States Heater Company, Detroit, and the names of the Capital, Hecla and Mascot steam and hot water boilers.

A NICKEL PLATED PIN TRAY or ash receiver, bearing the word "Richmond," formed of a peacock with his tail spread, made Parlor N, the headquarters of Thomas J. Douglas, sought alike by the ladies and the gallants. Mr. Douglas represented the Richmond Stove Company, Norwich, Conn., and found little time to talk steam and hot water boilers.

MUCH of the pleasure afforded the visiting ladies is due to the superb management and untiring energy of Mrs. M. L. Comstock, who guided everything so that no friction occurred. Mrs. Comstock is a sister of the Lane Bros., prominent plumbers in the city.

THE SPLENDID NEW TROTTING TRACK that is being completed at Detroit has a kitchen of the most approved style, with carving tables and a mammoth Peninsular steel range The men's toilet room is provided with 24 water closets and 32 urinals arranged to flush in series of eight. This work was done by Lane Bros.

THE IOWA DELEGATION distributed an official directory of the Iowa M. P. A., giving the officers and the members and their address.

C. H. WILLIAMS won all the ladies to the Dunning boilers by presenting them with a souvenir bottle of Lundborg perfumery, with the compliments of the New York Central Iron Works, Geneva, N. Y.

THE ROUSE & HILLS COMPANY, manufacturers of plumbers' goods, at Cleveland, Ohio, could have no more active and genial representative than Geo. E. de Heredia, who was met with a smile whenever he met a plumber.

TRAPS AND VENTS.

IN A RECENT ISSUE of a Baltimore paper a pleasant reference is made to the action of the Henry McShane Mfg. Company of that city in restoring to their employees the 10 per cent. which had been cut from their wages during the past winter. At the time of the reduction many complaints were made and a strike was talked of. Better counsel prevailed, however, and the men are now in a position to congratu late themselves that they did not resort to any violent method.

IN AN ADDRESS on the Progress of the Trade and its Future Development presented by Louis F. Meyer of Milwaukee at the Detroit convention of the National Association of Master Plumbers occurred the following paragraph in reference to the progress of the craft: The trade schools in the East are at least a beginning in that direction and in their limited capacities are doing a noble work for us, but time works wonders and I expect to see the day when the applicant for apprenticeship will be obliged to enter a preparatory school, just as our doctors do now, where they can acquire an insight into the fundamental principles of sanitation before they are allowed to figure as master plumbers.

JOHN HARDIN has opened a new plumbers' supply house at 3883 Cottage Grove avenue, Chicago.

M. REILLY has opened a branch plumbing shop in the room with Rand & Rader, Peru, Ind.

LEIGHTON, DAVENPORT & Co. have purchased the plumbing business of Hiram Norton in Bar Harbor, Maine.

AMONG RECENT INCORPORATIONS at Albany, N. Y., was the Standard Commode and Closet Company, to manu facture water closets and appurtenances in Brooklyn. Capital, $12,000, and directors, D. K. Osbourne and James Simpson of Brooklyn, and George F. Simpson of Montclair, N. J.

THE ITHACA PLUMBING & STEAM HEATING COMPANY, Ithaca, N. Y., is the name of a new firm that have been started by S. J. McKinney and others to do plumbing and steam heating.

E. J. MCNAMARA, formerly of the firm of Westwater & McNamara, Columbus, Ohio, has built at 46 Gay street, that city, a handsome structure for his own gas fitting business. The interior of the building is fitted up most completely, the walls being handsomely papered in pleasing colors. The basement is used as the work and stock room, while the store room proper is above. Here are shown an extended variety of gas and electric light fixtures, chandeliers, clusters, brackets, &c. In the center of the room is a pillar to which all electric lights center, which is surrounded by a circle of electric lights. The walls are arranged for a further display of goods. Besides the articles mentioned Mr. McNamara carries a full line of gas heating and cook stoves adapted for either natural or artificial gas.

IT IS REPORTED that P. A. Costello has opened a plumbing and heating business at Oshkosh, Wis.

WE ARE INDEBTED to Peck Brothers & Co., New Haven, Conn., for a copy of their catalogue of water and gas works goods. This pamphlet is serviceable in shape and size and is published with that neatness and excellence of workmanship that distinguishes the catalogues of this company. There is nothing particularly ornamental about it, but the matter is presented clearly, the illustrations are good and full particulars of sizes, numbers and the necessary information for buyers are presented. The pamphlet, which is bound in pebble cloth, rounded corners, contains 70 odd pages, almost all of which carry several illustrations. In the beginning is an index, which is followed by a complete telegraphic code. The goods illustrated are bibbs, stops, cocks, nipples, couplings, sprinklers, nozzles, hydrant work fittings, &c.

Some American Tin Plates.

We have been favored by the New Castle Steel & Tin Plate Company. New Castle, Pa., with a number of beautiful samples of the tin and terne plates made by them. These are genuine American material in the most rigorous sense of the term, the product from the ore to the finished plate being manufactured at the company's own works. As an illustration of what the American tin plate industry is capable of accom plishing, these plates are remarkable in their excellence of finish and superior qualities. They include IC and IX bright plates of both coke and charcoal finish, and of light and heavy weight, as well as heavily coated "old method" and ordinary terne plates. Each description is excellent, comparing with imported plates of like quality, generally to the advantage of the home product, and evidencing an extraordinary degree of progress for a works that is little more than eight months old. Accompanying the consignment were samples of light plates of No. 38 gauge, coke finish, which are claimed to be the lightest gauge tin plates ever made in America, and, probably, anywhere else. The metal coating of these sheets is evenly distributed, and the plates present a very handsome appearance. It is said to be impossible to tin black sheets of thinner gauge than these, as, in the process of pickling, the acid would eat them into holes. As it is, we understand that the coating of these 38-gauge sheets requires the greatest care in order to prevent this occurrence.

The New Castle Steel & Tin Plate Company's mills are capable of turning out much thinner black sheets than even 38 gauge, as is testified by samples sent to us which are thinner than the paper on which *The Metal Worker* is printed.

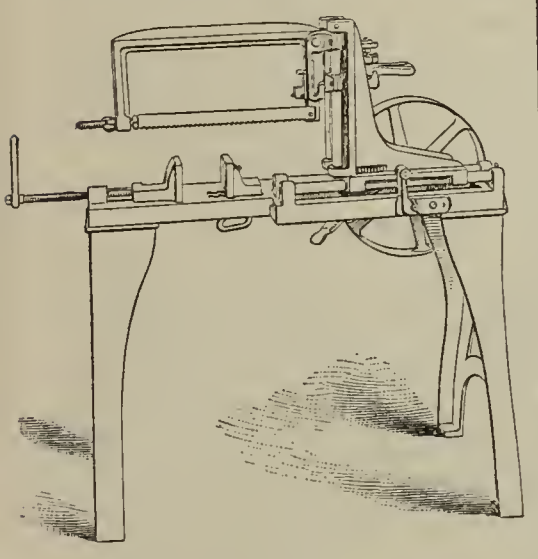
Captain Mahan has informed the Navy Department that the boilers of the "Chicago" have given out, and that it will be necessary for the vessel to remain a month or more at Antwerp for repairs. The "Chicago's" boilers have been in use since the vessel was launched. They will be replaced with new ones when she returns to the United States.

The Halifax, Nova Scotia, Board of Trade has memorialized the Canadian Government for a subsidy to enable the present telegraph cable from that port to Bermuda to be extended to Jamaica and other West Indian islands.

Dr. Senner, the United States Commissioner of Immigration at the port of New York, reports that just as many people left the United States in the steerage as have arrived during the 11 months to May 31 last.

The Q & C Shop Saw.

During recent years there has been a demand for power driven hack saws for cutting metal. Heretofore these machines have been provided with a gravity feed. The machine here illustrated—designed by the Q & C Company of Chicago and New York—has a positive automatic screw feed, and the speed can be instantly changed to accommodate hard or soft metal, large or small size. It will cut all kinds and sizes of metal up to 6 inches in diameter. The cutting speed is always the same. The stroke is horizontal, insuring perfectly square work, while the movable vise permits the entire length of the saw to be used. The machine is provided with an automatic stop. It is stated that this machine will do more work than the usual type, and that the saws will last much longer.



The Q & C Shop Saw.

SCRAP.

We are indebted to Edward Allred, 750 North Illinois street, Indianapolis, Ind., for a photograph of drawings illustrating a new tin plate package, upon which, we understand, he has secured a patent. It is a sheet metal box made with sliding cover and for which special claims of strength and durability are made. It is also claimed to be inexpensive in construction.

It is estimated that the salmon pack on the Columbia River will fall short of that of last year by more than 100,000 cases, owing to the recent floods. The manager of the Pacific Can Company, Astoria, Ore., places the probable decrease in the demand upon the works for cans at about 20 per cent. below the average, on account of the short catch.

Blairsville Rolling Mill & Tin Plate Company, Blairsville, Pa., closed down last week temporarily.

The Pittsburgh Tin Plate Works, New Kensington, Pa., about 20 miles from Pittsburgh, have given a contract to the A. Garrison Foundry Company of Pittsburgh for the erection of a two-mill plant, and when completed will roll their own sheets for tinning purposes instead of buying them as heretofore. The new addition will be so constructed that two additional mills can be added at any time desired.

The Baltimore & Ohio Railroad has obtained a seven years' extension of its control of the Chesapeake & Ohio Canal, and will, it is reported, operate it by electricity.

HEATING AND PLUMBING.

NEW WORK AND CONTRACTS.

Jos. E. O'Malley, 215 North Wells street, Chicago, has the contracts for the plumbing, gas fitting and sewerage in the following flat buildings: W. F. & W. E. Ross, Barry and Evanston avenues; P. O'Malley, Erie and Market streets, and A. Modine, 98 Townsend street.

Sealed proposals will be received at the office of the Supervising Architect, Washington, D. C., until July 20, for roofing, sheathing, slate and copper work of roof, dome and drain pipes, roof skylights, &c., for the Post Office Building at Worcester, Mass. Drawings and specifications may be obtained at the office of the Supervising Architect, Washington, or from the superintendent at Worcester.

The contract for the plumbing of the new office building now in course of erection on Fifth avenue, Pittsburgh, by the Carnegie Steel Company, Limited, has been let to Weldon & Kelly of that city. It is stated the contract amounts to about $40,000, which makes it one of the largest plumbing contracts ever let in Pittsburgh. There will be 14 separate sets of pipes varying in size from ¾ inch to 8 inches in diameter, extending from the foundation to the top of the building, upward of 240 feet. In all there will be nearly 5 miles of iron pipe, most of which will be double strength. All exposed pipes and fittings will be polished brass and nickel plated. The system of waste and ventilation will be what is known as the Durham system, all the pipes being wrought iron. The water supply from the street will be forced into two immense tanks on the roof by two separate steam pumps, after first passing through a filter and a suction tank in the basement. The water will then be conveyed back to the basement into two large distributing drums, and thence to the various fixtures. Two 350-gallon boilers will provide hot water for lavatories, &c., and return circulation pipes will keep the water constantly warm and ready to be drawn at any of the faucets. On the thirteenth floor the main lavatory will be located and will be notable for elegance of detail. In the sub-basement provision is made for a gymnasium and swimming bath for the exclusive use of the employees of the Carnegie Company. The contractors have begun work and expect to finish by January, 1895. There were nine bidders.

Lee Brothers, Concord, N. H., have been awarded the contract for the plumbing work of the new State library, and will also put the heating system in the National State Capitol Bank, using for the purpose a Gurney hot water heater.

Bids will be received by John S. Noble, City Clerk, Easton, Pa., until July 3 for the heating apparatus for No. 2 Engine House.

The contract for the plumbing of the Clay School building, Fort Wayne, Ind., was awarded to Byron Hattersley.

Sealed proposals will be received by the Board of New City Hall Comsioners, San Francisco, Cal., until July 2 for work, including the hot water heating, gas fitting, plumbing, &c., of the new City Hall.

Isaac Coffin & Co., Boston, Mass., will place a No. 5 Richmond hot water heater in a house owned by B. C. Leonard of Boston.

The contract for heating the Odd Fellows' Hall, Norwalk, Conn., has been awarded to E. K. Lockwood of Norwalk, who will use a No. 50 Richmond steam heater.

Sealed proposals will be received by John H. Peck, chairman of the Board of Court House Commissioners, Troy, N. Y, until July 14, for heating and ventilating by the hot blast or plenum fan system the new court house for the county of Rensselaer.

John D. Mouatt, Detroit, Mich., is doing the plumbing in the Wilson apartment houses. He will furnish 24 bathrooms with enameled baths, water closets and lavatories, besides the kitchen and laundry fixtures.

Barlow Bros. Company, Waterbury, Conn., will do the plumbing work on a fine new residence now being built in that town for Geo. B. Lamb, superintendent of the Farrel Foundry & Machine Company.

Hon. George Nicols, Northfield, Vt., has awarded the contract for heating his house to E. H. Randall & Co., Concord, N. H., who will use a No. 55 Richmond steam heater.

The Theo. Jacobs Company, 72 and 74 Market street, Chicago, are to install a hot water heating plant in the residence of Oscar Foreman, Michigan avenue, near Thirty-fourth street.

Kehm Bros. & Mertz, 289 Kinzie street, Chicago, have the contract for steam heating in the residence of John J. Schillo, 218 Mohawk street.

The Walsott-Hurlbut Company, 175 and 177 Lake street, Chicago, are to furnish the Siphon Eduction closet ranges for school buildings at Pontiac and Streator, Ill.

Among the contracts recently taken by Cook & Chick, 253 and 255 Kinzie street, Chicago, can be mentioned the following: Steam heating plant in the residence of William Holtz, Barry and Graceland avenues; hot water heating plant in the residence of D. L. Thomas, Forty-eighth street and Madison avenue.

Sealed proposals will be received at the Commissioners' Office, Franklin, Pa., until July 6, for work, including the plumbing, in the Venango County jail.

The Common Council of Duluth, Minn., have confirmed the award of contract made June 11 by the Board of Public Works with Allen Black for steam heating and plumbing in the Central Fire Hall, at $3592.

The Davis Johnson Company, 45 Jackson street, Chicago, are to place Schill's New Idea warm air furnace in the following residences: P. Clements, 4253 South Halsted street; J. C. Whitten, 6538 Myrtle avenue; H. F. Rose, Sixty-third street and Greenwood avenue; V. C. Clare, Commercial avenue; John Bell, 5519 Emerald avenue; A. W. McCormack, 400 Sixty-seventh street; Geo. J. Shannon, Sixty-fifth and Peoria streets; Dr. E. B. Greene, Humboldt boulevard; Wm. M. Townsend, 7648 Ford avenue; Wm. Easton, 616 Waller avenue; W. F. C. Bronter, 1566 Fulton street.

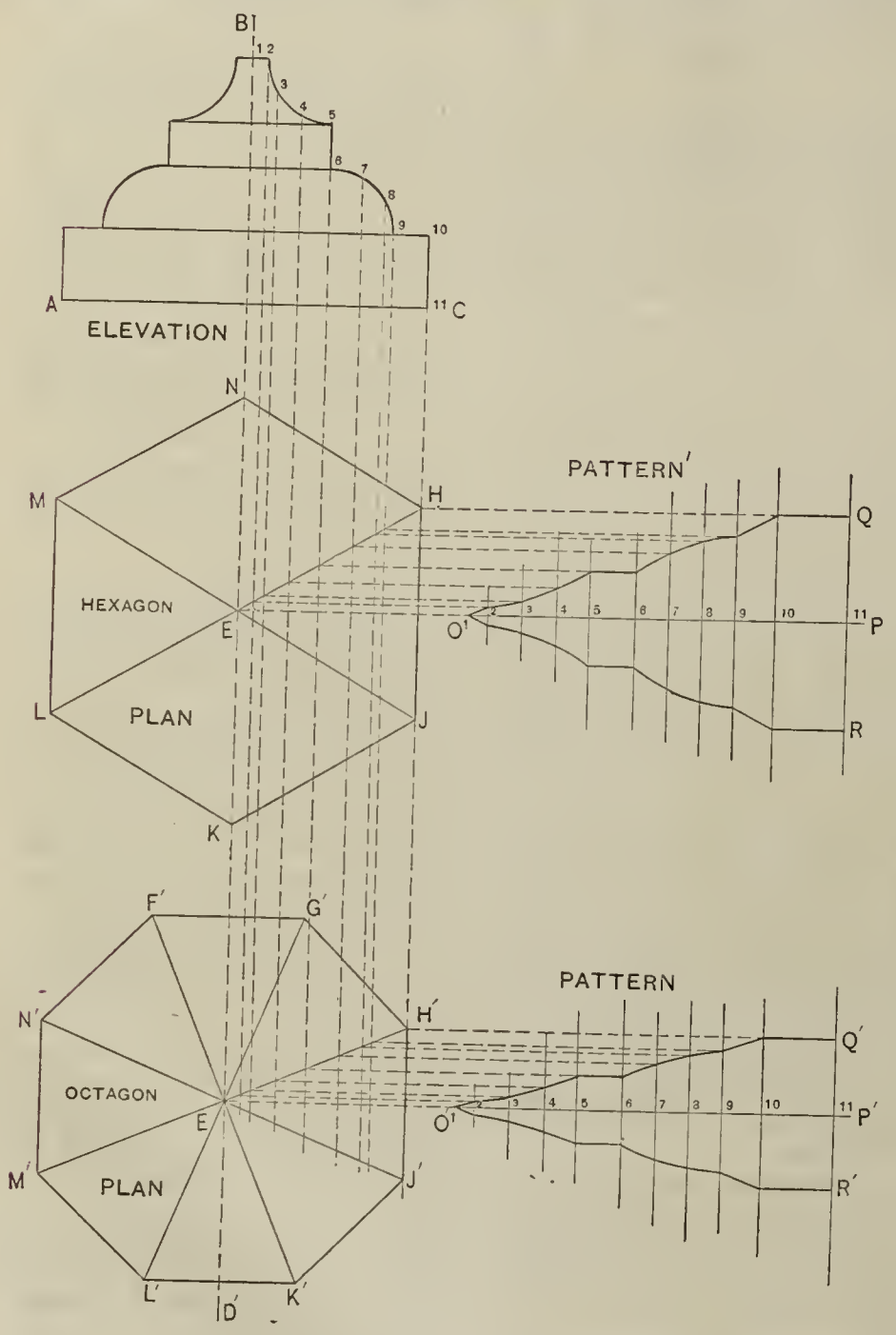
The new city directory of Chicago gives an estimated population of 1,700,000 to the Windy City.

ROOFING AND CORNICE.

Pattern for Article Having Any Number of Pieces.

From C. R., *Newark, N. J.*—Will *The Metal Worker* publish a method for obtaining the pattern of an article, such as a finial or leader head, in any number of pieces?

Answer.—We understand from the above that our correspondent wishes a method for obtaining the pattern of an article that is a regular polygon in plan. In the accompanying engraving let A B C represent the article in elevation for which patterns are required. Below the elevation is shown the hexagon H J K L M N, and the octagon F′ G′ H′ J′ K′ L′ M′ N′. These two plans show the manner in which the plan is to be drawn under the elevation for an article having any number of pieces. To obtain the pattern of an article that is a polygon in plan, first draw the elevation in such a manner that one side will appear in profile in the elevation, as B C, and place the plan so as to correspond in all respects with it, as shown. For the pattern of article A B C, the plan of which is a hexagon, proceed as follows: Divide the profile B C into spaces of convenient size and number them, as shown by the small figures. With the T-square placed parallel with C J, and brought successively against the points in profile, drop lines across the miter lines, as shown by the dotted lines in the engraving. Lay off a stretchout, O P, at right angles to the side of plan H J, corresponding to the side of article B C of elevation. Through the points in stretchout line O P draw the usual measuring lines. Place the T-square parallel to the stretchout line, and, bringing it successively against the points in the miter lines, cut corresponding measuring lines, as shown. Lines traced through the points thus obtained, as shown by Q O R, will be the pattern of part of article shown by H E J of plan. The pattern for H′ E′ J′ of octagon, as shown by Q′ O′ K′, is obtained in a similar manner.



Pattern for Article Having Any Number of Pieces.

FLASHINGS.

A. S. RASNER of Rasner & Dinger, Pittsburgh, manufacturers of metallic skylights and sheet metal work of all kinds, will have the sympathy of his friends and the trade in general in the loss he has met with in the death of his son Albert, who lost his life a few days ago by drowning while bathing in the Allegheny River with some friends. The young man, who was in the employ of his father, was universally respected.

W. J. BURTON & Co., Detroit, Mich., manufacture sheet metal cornices, ceilings, skylights, finials and shingles and furnish slate, tin and steel roofing. They issue a special catalogue of their Eastlake metal shingles and tiles, giving the advantages and full instructions for putting them on. All of their goods are painted on both sides. They also make a full line of conductors and elbows and eave trough of galvanized iron in 8-foot lengths.

IN CONNECTION with the covered reservoir lately completed at Rockford, Ill., the roof employed is something of a departure from old style coverings for this purpose. It is of concrete, composed of sand and cement, but it is only 2 inches thick. It is supported on concrete arches which span the entire width of the reservoir, the ribs being 7 feet apart, 7 inches thick and about 1 foot deep over the top. After these were made expanded metal lathing of 2½-inch mesh was spread over the surface and then concrete laid on to the depth of 2 inches. The roof is calculated to hold a weight of 100 pounds to the square foot. After the temporary supports were removed the under side of the roof was plastered, completely covering the iron.

THE WHITE & ENNIS CORNICE & ROOFING COMPANY of Troy, N. Y., were incorporated last week, with a capital of $7500. Directors: David White, Jesse D. Ennis and Robert J. Wylie of Troy.

AMONG THE CONTRACTS recently taken by James A. Millar & Bro., 129 and 131 Clinton street, Chicago, can be mentioned the following: Slate and other roofing for the residence of George P. Barton, Fifty-third street and Lexington avenue; cornice work for building of Henry Appel, Fiftieth street and Michigan avenue; 250 squares of corrugated iron work for Chicago Sugar Refinery; new red slate roof for Chicago

Club House, Van Buren street and Michigan avenue; slate roof and copper work for residence of Chas. F. Atkinson, 4833–5 Lake avenue; roof for new tower of Board of Trade building.

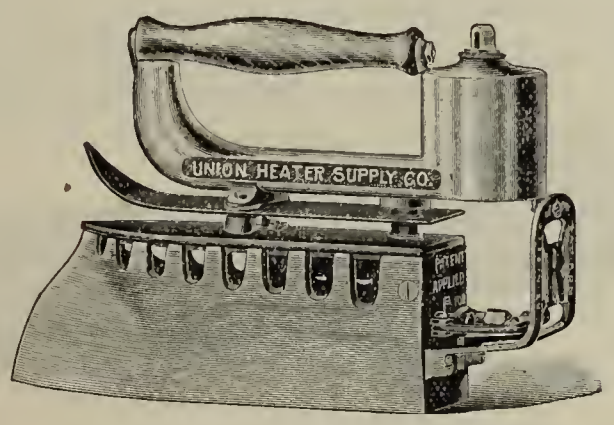
THE PENN IRON ROOFING & CORRUGATING COMPANY, LIMITED, of Philadelphia, Pa., have issued a number of supplemental pages intended to be inserted in their ceilng catalogue. The pages carry illustrations of plain reeded ceiling plates and sheets, designs of special shallow panel ceiling plates, shallow molded plates in combinations, together with colored designs showing corners of ceilings finished, while other designs are of centers and mold combinations. The pages are numbered, showing their position in the regular catalogue of the company.

JAMES J. WHITE, 185 Dearborn street, Chicago, is to furnish the tin roofing, galvanized iron cornice work and a skylight 40 x 60 feet, for a hotel building at La Fayette, Ind.

AMONG the contracts recently taken by J. C. McFarland, 2511 to 2519 State street, Chicago, can be mentioned the following: Copper cornice work and tile roofing for the residence of Leon Mandel, Michigan avenue and Thirty-fourth street, the Telladon Terra Cotta Company's new shingle tile to be used; copper cornice work and tile roofing for residence of Philip Armour, Jr., Michigan avenue and Thirty-second street; slate and copper work for the court house at Aledo, Ill.

Self Heating Tailor's Iron.

The Union Heater Company, Detroit, Mich., manufacture a self heating gasoline tailor's iron, a general view of



Self Heating Tailor's Iron.

which is shown in the accompanying illustration. The body is made of cast iron and the tank is of brass, both being heavily nickel plated. The burner is on the inside and the gasoline passes from the tank down through a brass generator, which is also on the inside of the iron, flows into a valve and then into the regular burner, where the flame strikes the bottom of the iron. The flame is controlled by an angle valve on the back in such a manner that it can be brought from a low flame to an intense heat immediately. The irons are manufactured in three sizes, 18, 20 and 22 pounds, and can be operated, it is said, at the small expense of 2 or 3 cents a day, enabling the tailor to turn out more work with greater comfort, and get rid of the annoyance of dirt and soot met with in the use of charcoal.

The Fennessy Company of New York City have been incorporated, with a capital of $20,000, to deal in patented gas and oil burners, stoves, heaters, &c. The directors are Frank R. Fennessy, Emma H. Fennessy, Chas. Feichheimer and Eugene A. Schell of New York.

Rustless Iron.

At the recent Montreal meeting of the American Society of Mechanical Engineers, M. P. Wood presented a paper on "Rustless Coatings for Iron and Steel." It is a general summary of the methods in vogue without special reference to any experience personally acquired. Mr. Wood summarizes his conclusions on the whole question of how best to protect iron and steel from corrosion as follows:

Don't use anything but common iron.

Don't have any scale on that.

Don't use anything but the best iron and steel.

Don't polish those.

Don't paint it with anything but pure linseed oil and oxide of lead or graphite paints.

Don't let the air get to it if it is damp.

Don't keep it from the air if the air is pure and dry.

Don't let sea air, sea water, acidulated or sulphurous, ammoniacal or other fumes and liquids have access to it.

Don't think it unnecessary to protect it in any case, because swords, armor and other bright articles of iron and steel have been found uninjured by rust after an exposure of over 500 years with no other protection than that afforded by the closed room in which they were placed.

Don't think your own product would not under the same conditions last as long as the piece of iron that was walled into one of the burial chambers of the Pyramid 3000 years ago.

Don't put it in any location where it cannot be inspected and its true condition ascertained at any time, by anybody, your successor in the trust not excepted.

Don't think that magnetic oxide, electroplating, enameling or any other method of protection will take the place of constant inspection, even if the coating is fired on by a Columbiad.

Don't imagine because Cleopatra's Needle has had to have a coating of wax to protect it, that it is not a good material to apply to other substances than granite.

Don't let the cost and interest accounts be the governing factors in the case of protecting any metal superstructure on whose continuity and strength human life and safety depend The old story of "for want of a nail the shoe was cast, the horse disabled, a battle and kingdom lost," finds too many parallels in the engineering practice of to day, until in some cases we seem to need protection from the engineer quite as much as from the decay of the materials in which he experiments.

Don't imagine that Macaulay's New Zealander, who has sketched the ruins of England's power and greatness, and has come to the New World to see how we have fared from the gnawing teeth of time, will not recognize amidst the ruins of our Statue of Liberty, Brooklyn Bridge and other monuments of our progress, the ominous streaks and stains due to the corrosion not only of iron and steel, but that of the better class of metals, and will exclaim: "We are wiser in our generation and fear not and can control these forces that, like the Arch, slumber not nor sleep."

In the discussion, J. F. Holloway called attention to the fact that tin roofs in Montreal were not painted, a circumstance which was attributed to the use of good materials and the distance from the sea air. C. W. Nason reported that for tank and outdoor use, in his experience, the best protection is the P. & B. paint, a solution of asphalt in bisulphide of carbon. Gus. C. Henning called attention to the experiments recorded by W. Thomson in a paper read before the English Society of Chemical Industry. The method proposed is to connect structures by wire with a ball of zinc buried in moist ground, thus transferring the destructive effects of electrolytic action to an outside body.

James McBride of Brooklyn related his experience with a number of boilers in his paper, "The Corrosion of Steam Drums." From his observations and experiments, extending over nearly four years, he draws the following conclusions:

1. That the corrosion is due primarily to excessive moisture in the steam in the drum.

2. That moisture in this case was due to the priming of the boilers and surface condensation in the drum.

3. That the trouble was aggravated, because no provision was made to take away the water from the drums by drip pipes.

Professor Hutton presented a sketch of a 3-inch cast iron elbow from the bottom of the descending column of a Bulkley condenser used near Port Henry, N. Y., as an illustration of mechanical corrosion. J. T. Hawkins gave it as his experience that currents of water in pipes wear away the metal, and that the impact of steam or water or water laden steam produces the same result. L. S. Randolph noted that water charged with sediment causes corrosion by attrition and by the mechanical removal of the oxide. Fred. Grimm reported that trouble caused by corrosion in steam coils was overcome by establishing good drainage.

Extensive improvements are being carried out at the sheet iron mills of the McCullough Iron Company, North East, Md. Several oil burning furnaces are being introduced, and a tank to hold 25,000 gallons is in course of construction for the purpose of supplying oil to the furnaces.

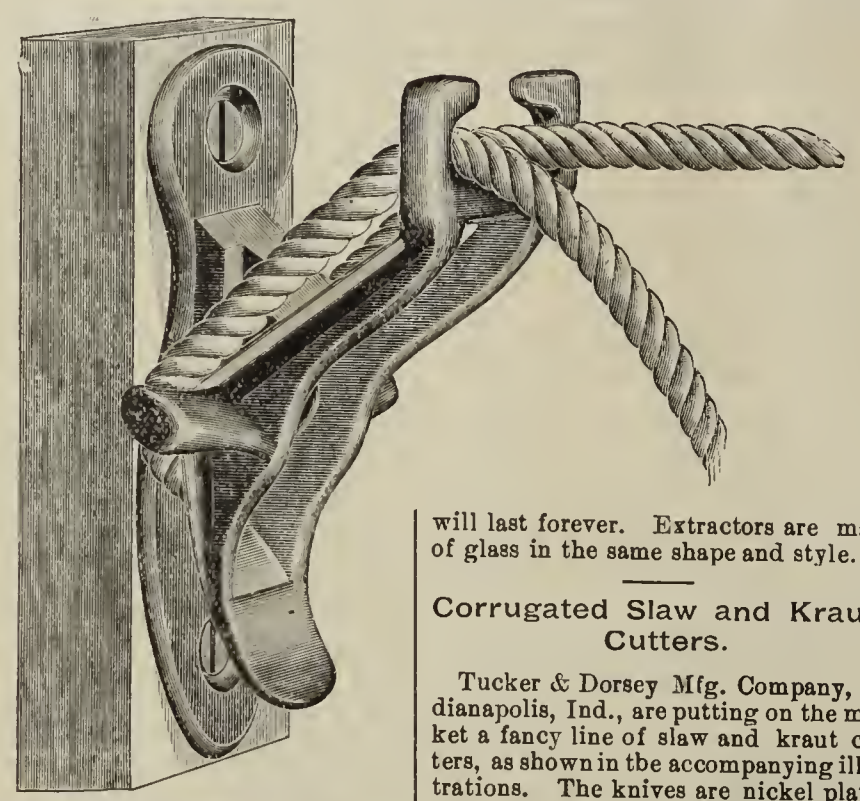
Asbestos, says a South African journal, is being mined in large quantities on the Kalputs farm, Prieska District.

The result of the Derby race was received in New York by the United Press from the office of the Direct United States Cable Company just one second after it was filed in London.

THE RETAIL STORE.

Lightning Clothes Line Fastener.

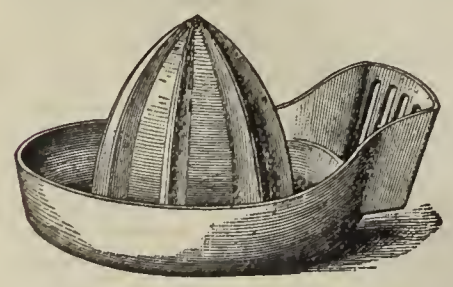
The accompanying cut represents a clothes line fastener introduced by the Standard Mfg. Company, Florence, Mass. Among the desirable points claimed for the fastener are the following: That the line can be put up, taken down, tightened or slackened in a moment; that knots are obviated; that lines cannot slip; that cold or wet weather does not affect the fastener; that should a line break between two fasteners the remaining line or lines would in no way be disturbed, and that no clothes pole is required, as a pull on the line makes it tight and the fastener holds it. The fasteners are furnished japanned or galvanized, packed one dozen in a box, two gross in a case. The manufacturers will furnish a sample free, post-paid, and will quote prices upon application.



Lightning Clothes Line Fastener.

Monitor Aluminum Juice Extractor.

Sterling Aluminum Company, 1195 Fulton street, Brooklyn, N. Y., are offering the aluminum juice extractor here shown. It is cast of pure aluminum and has well defined ridges on the cone. It has a large reservoir to hold the juice and an ample spout and strainer. It is not necessary to use it in connection with a cup or glass, as the reservoir catches the juice, so the extractor may be used anywhere. The manufacturers claim that fruit acids do not affect it; that it will not corrode or tarnish; that it will not break like glass, and that it will last forever. Extractors are made of glass in the same shape and style.



Monitor Aluminum Juice Extractor.

Corrugated Slaw and Kraut Cutters.

Tucker & Dorsey Mfg. Company, Indianapolis, Ind., are putting on the market a fancy line of slaw and kraut cutters, as shown in tbe accompanying illustrations. The knives are nickel plated and ground with corrugated edges.

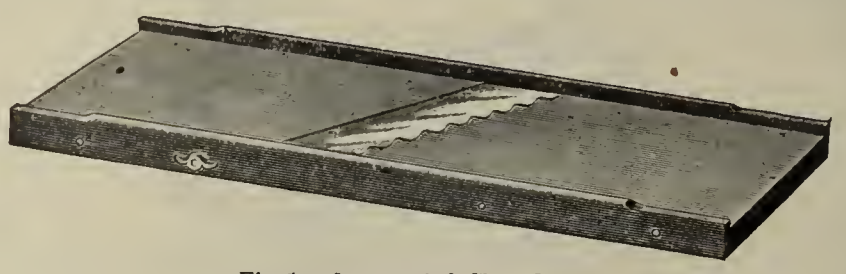


Fig. 1.—Corrugated Slaw Cutter.

The goods are referred to as made throughout of extra quality material and of handsome finish. Particular attention is called to the patented device for the adjustment of the knives, it being explained that the bolts are loosened, the knives set for the desired cut, and the bolts again tightened, no other directions being necessary. By taking out the bolts the knives are released and may be removed for sharpening.

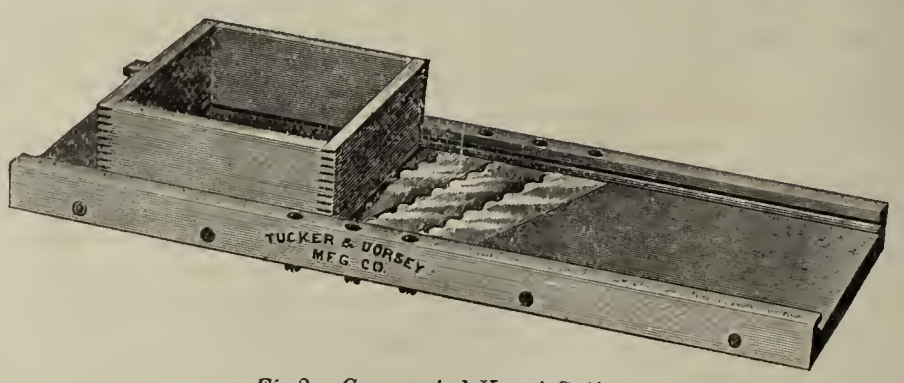


Fig 2.—Corrugated Kraut Cutter.

Wick Raising Movement and Lighting Lift.

The Plume & Atwood Mfg. Company, 18 Murray street, New York, are applying improvements to all their Nos. 1 and 2 Royal lamps and founts as herewith illustrated. The ratchet wick raising movement shown in Fig. 1 gives, it is stated, perfect control of the wick with exactness in adjustment. The point is made that it overcomes the objection to the draw bar lift, which in regulating is apt to move beyond the point desired, causing the annoyance of a smoked chimney or an extinguished flame. The lighting lift in Fig. 2 lifts on a spiral movement and remains in position while lighting without removing either shade or chimney, leaving the hands absolutely free. The improvements are put on the Royal hand, table and banquet lamps of different designs, and also on those in wrought iron patterns.

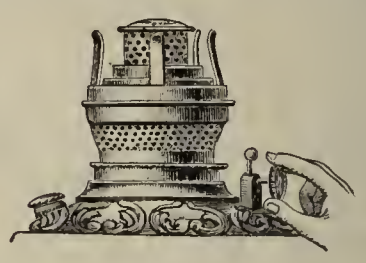


Fig. 1.—Ratchet Wick Raising Movement.

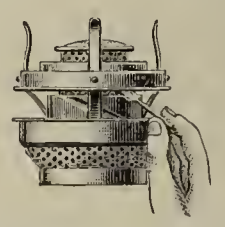


Fig. 2.—Lighting Lift.

Hoffman's Vault and Library System.

The Geuder & Paeschke Mfg. Company of Milwaukee, Wis., have absorbed the business of the Hoffman-Keefe Office File Company, and are now manufacturing that company's specialties, among which are the Hoffman vault and library fixtures, recently



Fig. 1.—Document File.

brought out. By this system, large vaults for the use of banks, merchants and manufacturers, requiring a large amount of room for the storage of valuable papers, are fitted up with metal shelving, drawers, compartments, files for letters, &c. Illustrations are here-

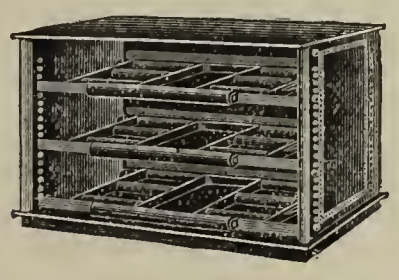


Fig. 2.—Roller Book Shelves.

with given of some of the features of the system. Fig. 1 is a file for compressing documents. The compressor grips the papers from the center down and squeezes them. The file comes



Fig. 3.—Check Sorter.

clear out of its compartment and hangs there. The papers can be shuffled any way, as the file has no sides. A special kind is made for bank checks. Fig. 2 represents



Fig. 4.—Metal Cabinet.

a set of roller book shelves intended for storing large, heavy office books. They are laid flat and given an even bearing on rollers to prevent friction or wear. Fig. 3 shows a check sorter which has been found very convenient in banks. In Fig. 4 is shown a metal cabinet. Fig. 5 represents a nest of safety deposit cells, each with its own key. These are frequently used by large companies, each of whose officers desires a storage place for his own personal documents and valuables. Fig. 6

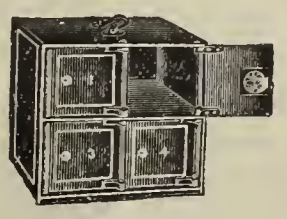


Fig. 5.—Safety Deposit Cells.

is a vault omnibus or movable case, which is found a most convenient article in offices in which a large number of books and papers are in daily

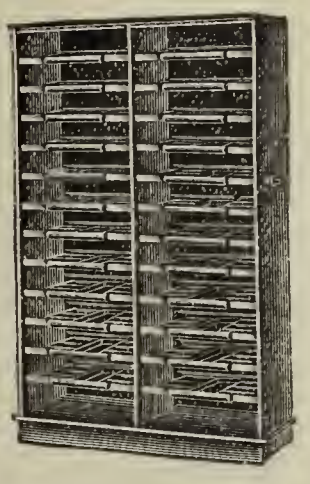


Fig. 6.—Movable Case.

use outside of the vault. It is made with roller book shelves. The whole case is mounted on double wheel anti-friction casters, so that one person can easily run it in and out of the vault. The casters are hidden by the risers of the base.

The Goodell Bread and Cake Knife.

The cut here shown represents a bread and cake knife put on the market by Goodell Company, Antrim, N. H. The knife has a curved, saw toothed cutting edge, and it is remarked by the company that the high grade of steel used in the blade enables it to be made very thin. The side of the blade is perfectly flat, the corrugations or curves extending about $\frac{3}{8}$ inch from the edge, being the same depth their entire length.

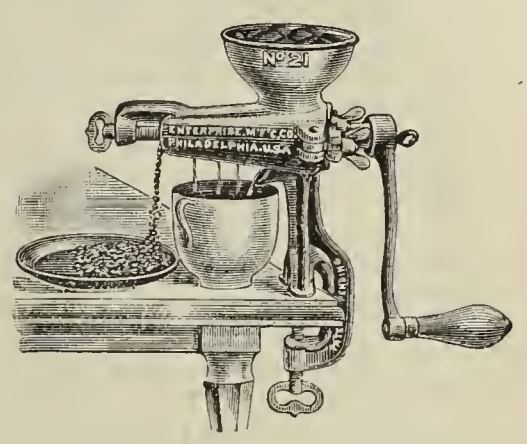


The Goodell Bread and Cake Knife.

The makers state that when necessary the blade can be ground on the side opposite the grooves without changing the shape or cutting qualities of the edge in the least; also that no skill is required to do this, as it would be impossible to get the edge out of shape. The manufacturers claim that the feature of sharpening is peculiar to this knife, and that it can be sharpened again and again and remain practically as good as new. The point is also made that the style of the handle, shape of the blade and the general appearance of the knife are attractive. The knife is referred to as particularly adapted to cutting hot bread and cake.

Enterprise Juice Extractor No. 21.

The cut here shown represents a juice extractor put on the market by the Enterprise Mfg. Company of Pennsylvania, Philadelphia, for whom J. C. McCarty & Co. are agents, 97 Chambers street, New York. The manufacturers state that the construction of the extractor is mainly the same as their regular combination press, with the addition of such mechanical devices as to adapt it for the extraction of juice from meat, also answering for extracting seeds and



Enterprise Juice Extractor No. 21.

juice from fruits. It is explained that the machine being tinned no metallic or inky flavor will be imparted to the material used, and that the dryness of the pulp or refuse can be regulated by the thumb screw at the outlet.

MEMORANDA.

Frank Hesse of Clarksville, Iowa, announces that he has secured the services of W. A. Kirck, a practical cornice man, and is prepared to manufacture anything in that line. Mr. Hesse carries in stock a varied assortment of stoves, hardware and tinware.

S. Fox of No. 139 New Main street, Yonkers, N. Y., has recently doubled the capacity of his house furnishing store. The premises now occupied are 25 x 50 feet in size, and in calling the attention of the people of Yonkers to the increased capacity of the store Mr. Fox distributed fans on the back of which are verses telling in a clever way of the growth of the business, and asking patronage of the good people of Yonkers.

The Ellicott Electric Heating Company of Buffalo were incorporated on June 22, with a capital of $25,000, to manufacture apparatus for electricity for heating and power purposes. The directors named are C. W. Pardee, John N. Scatcherd, Daniel O'Day, Edwin T. Evans, Barrett Rich, George Urban, Jr., Joseph L. Hunsicker, Charles R. Huntley, John J. Albright, Edmund Hayes and Franklin D. Locke of Buffalo.

STOVE TRADE NOTES.

Philadelphia Stove Trade.

The season has opened and salesmen are out, but reports so far indicate that the bulk of the business will be somewhat late. Sufficient business, however, is being done to create a demand which exceeds the production, and there being practically no stocks in the hands of dealers, manufacturers anticipate a good season's business. Dealers are hesitating about placing their orders, many questions arising to delay action. They realize that the hand to mouth buying indulged in last season will not be safe to attempt this year. Stove manufacturers have all along been producing only in quantities sufficient to supply current demand, and count on taking care of any increased inquiry which a change in the business conditions of the country may bring by running their works full capacity. The opinion prevailing is that such a change is not far distant, and by fall foundries will be running full. Buyers, therefore, are studying their prospects for business, and orders will assume fair proportions. Duplicate orders cannot be depended on, as in the event of a rush, which is not at all improbable, the filling of orders would not be prompt and serious delays would ensue. Orders would, of course, have to be taken in rotation and it would be hard to specify dates for delivery.

Wise dealers are already approaching their customers on the subject of repairs. Manufacturers have very light stocks of repairs on hand, and if their foundries have to stand a run on them for finished goods it will be impossible to pay attention to repair orders, as every flask will be utilized in getting out the regular goods, and it would be neither expedient nor profitable to bother with repairs. The latter can be readily furnished now, but it is likely there will be difficulty experienced in getting them later.

Prices of goods are firm, and in view of the fact that owing to the decreased production of foundries the cost of production has been greater, there is not the slightest prospect of a cut in prices being made. It is true that the cost of iron is very much reduced, but the cost of labor remains the same and the gain on account of cheap iron is too trifling to take into consideration. Again, no more business could be done by cutting prices, the decrease in production all round offsetting any necessity for seeking to unload at a sacrifice.

Collections are slightly better than when last reported, although they are far from being up to the mark. There is still a good deal of laxity on the part of some in the trade to make settlements, and they will not settle in cash where there is the slightest possibility of the acceptance of a note. At no time does a business man better enhance his credit than when during a period of depression he comes to time with his payments.

St. Louis Stove Trade.

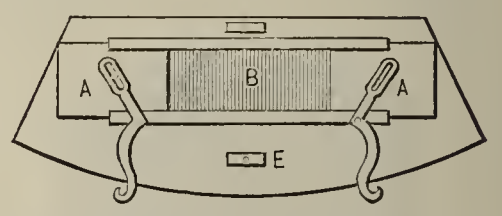
The stove trade is beginning to show signs of returning activity. The total number of stoves sold since January 1 will compare favorably with preceding years. The cutting of freight rates contributed largely to this end, and it is for this reason that stocks are not now abnormally large. During the past three months production has been curtailed very materially, only one foundry out of four running, and that one only three days a week. This reduces the production 87½ per cent., and as sales are nearly equal to those of last year, it can be seen at a glance that any unusual demand will rapidly deplete stocks. While the outlook could be better, yet it is more than satisfactory when the same period of last year is taken into consideration. At that time everything was muddled and it was impossible to choose the weak from the strong dealers. Now, however, it is radically different. Dealers who came through last year are in a position to weather almost any kind of a storm, and their credit is, in most cases, improved by their experience.

A peculiar feature of this season's trade is seen in the introduction of two styles of stoves which are creating more or less attention. They are the hot blast stove and the wood burning stove, known as the air tight heater. This latter stove has been on the market for two years past, but has never created very much attention until this year. The sale promises to be large and is generally conceded by stove manufacturers to be a good thing, as it will largely take the place of box stoves, which, it is stated, have long been sold at a loss to the manufacturers.

The hot blast stove is, practically speaking, a small furnace, which, instead of having the ordinary jacket of galvanized iron, is inclosed in a cast iron casing of elaborate design, which in appearance is as artistic as a base burner. The claim is made that these stoves are easily regulated, clean, economical in the use of fuel and will hold fire for 24 hours without attention. The hot blast and the air tight heater are dividing attention with the steel range, which is also a leader just now. The local makers are busy with new goods, which will shortly make their appearance in the catalogues issued by the different manufacturers.

Improved Regulator for Stoves.

A rather novel means of checking the draft in stoves has recently been brought to the attention of the English trade by an inventor named Tibbits. It is conceded that the ordinary domestic grate in use in England is far from perfect and that the appliance referred to tends to accomplish a great saving in the way of fuel. We cannot do better perhaps than to republish the inventor's description of the device, which in connection with the illustrations presented herewith will enable the reader to comprehend the construction and operation of the device:



Improved Regulator for Stoves.—Fig. 1.—Showing Regulator Open.

This invention consists of an iron plate the size of the bottom of the stove, with two doors running in slides, and opened and shut by levers. The plate is fixed underneath the bottom of the stove by the aid of two small screws and nuts, which hold it up to the bottom. When the doors are open (for lighting the fire or drawing it up) the levers or handles project slightly in front, as shown in Fig. 1 of the cuts.

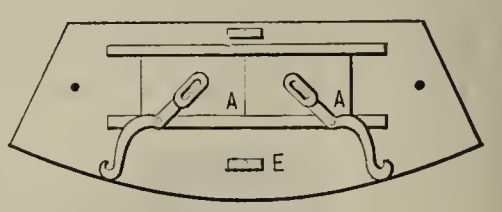


Fig. 2.—Showing Regulator Closed.

When the doors are closed (to obtain slow combustion) the levers or handles will be as far from one another as possible, and hidden under the bottom bar of the grate, as indicated in Fig. 2.

Referring to the illustrations, A represents the doors; B, the open space when the doors are open; E, the slot through which runs the screw which, with a nut below, fixes the plate to the bottom underneath the stove. Both figures show that side of the plate which when fixed will face the hearth.

Peoria Stoves

is the title adopted by Culter & Proctor Stove Company of Peoria, Ill., for their 1894 catalogue. This publication is a handsome volume of 88 pages, in the popular small size. It is bound in scarlet cloth, lettered in gold, and the edges are tinted in yellow. The pages have a half border, consisting of a red line, with the company's trade-mark at the upper corner. An introductory note calls attention to the special stoves and ranges enumerated in the catalogue, for which superiority is claimed in quality, finish and accuracy of castings, peculiar and perfect adaptability to the various fuels used in the West, and a number of other points. The most prominent position is given to the Peoria-Lexington six-hole range, intended for either coal or wood. It is shown in a number of styles—with high and low closets and reservoir, with high closet and reservoir, with high shelf and reservoir, with tea and pipe shelves and low closet and reservoir, with tea stands and reservoir and in square form with no accessories but tea stands. It is furnished in three sizes, is attractively designed and ornamented, and is offered as a first-class range in every respect. A four hole range, exclusively for soft coal, is also made under the name Peoria-Lexington, which is furnished in any style and in two sizes. A line of cook stoves, from entirely new and original patterns, is presented under the same name. They have flush tops and square ovens, are constructed on graceful lines with skirting and panels effectively ornamented, are especially adapted to soft coal, and are furnished in three sizes. Another line of soft coal cooks, in six sizes, is shown under the same name, at a somewhat lower price. The Wabash is an attractive but low priced coal and wood cook, made in two sizes. The Woman's Rights is a cheap coal cook in one size only. The Antelope range is a four-hole wood burner, made in all styles and three sizes. Antelope wood cooks are also shown in various styles and are furnished in four sizes. Heating stoves comprise, under the general name Peoria, several styles of all cast wood base heating constructions of the Todd type, but with special features of construction and draft covered by patent; a square hot blast base heater for wood; a square hard coal base burner, and a square soft coal base heater. Other heating stoves shown are the Challenger, a round surface burning base heater for hard coal or coke; the Model Peoria, a square hot blast ventilating parlor heater for soft coal; the Peoria Queen, a square stove for soft or hard coal, designed as a substitute for the oak style; the Peoria Oak, in a number of forms, to cover all requirements; the Oak Cottage, for coal and wood; the Black Hawk, a new cannon stove; the Chief, an extra heavy cannon stove; the Sprite, a two-hole dwarf stove, for coal or wood; the Sunbeam, for hard or soft coal, and the Empress, for wood. The company also manufacture Magee's patent kitchen sink and common sinks and carry in stock a complete line of ground and plain hollow ware.

CHARLES E. COLEMAN, representing Eugene Munsell & Co., 218 Water street, New York, is sending to his friends in the trade a miniature grip with a tag attached, and accompanied by a letter, the body of which reads as follows: "I send herewith my grip as a reminder that I will visit you in a few days. Kindly hang this up, and in the meantime do not complete arrangements for your fall line of goods until I see you. That's all."

ODD PLATES.

THE GAS MANUFACTURING COMPANIES have affected the business of selling gas stoves in more ways than one. For the purpose of increasing the sale of gas they hastened the introduction of gas stoves, until they are now no longer regarded as an experiment or luxury, but as a standard article. The method of introduction has been to furnish a stove at so narrow a margin of profit that, without the profit received from the sale of gas the traffic would not be a paying one. If the interest created by this method of bringing the stoves before the public is not taken into account the method may be deplored, but it is generally considered that, in spite of the times, more gas stoves will be sold this year than in any previous one. This is largely due to the fact that there are a number of factories making gas stoves this year for the first time; a better stove being offered and generally at prices very much reduced. Owing to the financial depression the consumers are not buying as they otherwise would, and those factories which have a stock of new goods are making sales at low figures. The gas stove dealer gets a share of the orders, as many buyers do not care to have the gas company know a gas stove is being used. The dealer, while getting a better price, as a rule, than the gas companies, insists on buying at low prices that are unsatisfactory to the makers. It is urged that this reason, and the belief that there is still a large and profitable future for the gas stove, has induced several of the larger makers, holding a number of valuable patents, to consider the consolidation of their interests in one large company. The object, doubtless, is to save a large expense in selling the goods, as well as in producing them. Whatever may be the result of this effort it points to two things: the one being the faith that, in the near future, the gas stove will be more generally used; the other that, to both the maker and dealer, the present prices and sales are not such as make the business thoroughly satisfactory.

NOTWITHSTANDING the severe business depression which has prevailed all over the country during the past year the Favorite Stove & Range Company of Piqua, Ohio, have been making improvements with a view to increasing the capacity of their already extensive plant. Prominent among the changes which they have made may be mentioned the grouping of their nickeling, buffing, grinding and polishing departments in one large brick building especially erected for the purpose, thereby increasing fully one-half the size of their former mounting room. They have also completed the erection of a new boiler and engine house, fitting and equipping it with a large size Hamilton Corliss engine, with a battery of boilers and an electric light dynamo.

THE "Journal of the Royal United Service Institute of Great Britain" records that during the last military maneuvers in Russia experiments were made with the Norwegian cooking stove, the object being to provide the troops on the march, within the least possible space of time, with warm food. The apparatus used was the ordinary camp kettle fitted into a thick felt covering. The soup or stew being placed in the kettle is raised to the boiling point and then removed from the fire, the lid clamped down, the kettle inserted in the sheath, and the whole slung in the usual manner below the wagon. The process of stewing continues automatically, thanks to the heat retained, and even after several hours' marching the temperature does not fall below 100° F.

THE FAVORITE STOVE & RANGE COMPANY, Piqua, Ohio, have been getting out some new stove trade literature in the way of a handsome catalogue, copies of which are being distributed to the trade. This handsome publication has been carted to the post office in barrel lots at the rate of not less than two barrels a day, and at latest advices the work of distribution was not yet completed. This is significant when it is taken into consideration that the catalogues are sent only to customers whose names appear upon the books of the company. A review of this handsome volume appeared in these columns last week.

THE SAFETY FURNACE PIPE COMPANY, Detroit, Mich., have kept their force busy making up their specialties for furnaces and the elbows, boots, register boxes, &c., for house heating during the winter. Their trade is steadily widening, recent shipments having been made to Los Angeles, Cal., and New Orleans, La.

THE ECLIPSE STOVE COMPANY of Mansfield, Ohio, send us a package of advertising matter, among which is a little pamphlet of 40 pages containing testimonial letters from those who have used Eclipse stoves and ranges; a circular descriptive of the Eclipse Russia iron and sheet steel roaster and baker; a folder giving the shipping weights of various lines of stoves; another folder which gives directions for operating stoves and a catalogue relating to the Premier Eclipse six-hole range. The latter is a handsome construction of substantial appearance and embodies the modern improvements. It is made in several sizes, arranged for burning coal and wood and also for burning wood exclusively. The manufacturers refer to the flue construction as being of such arrangement and capacity as to give a full and free circulation.

L. G. COMPARET, 314 Walnut street, Des Moines, Iowa, has brought out, in connection with a line of steel ranges, a portable oven made in two sizes. In making this line of ovens the intention has been to present a mode of construction which would meet every requirement of economy, durability and heating capacity. The body of the oven is made in two thicknesses of No. 27 galvanized iron, well riveted, double seamed and braced, and having a lining of heavy asbestos board. The flues are of heavy steel and the shelves are of steel strips riveted together. Mr. Comparet states that the ovens have been thoroughly tested in many of the leading bakeries, hotels and restaurants throughout the State of Iowa.

THE GIRARD STOVE & FOUNDRY COMPANY of Girard, Ohio, send us a copy of a catalogue and price-list which they have just issued, relating to the Adelbert stoves and ranges. This is the first catalogue which the company have issued, and in the announcement to the trade they give a few facts concerning their history. The Adelbert stoves and ranges, it is pointed out, are manufactured from the best quality of material, embody the latest improvements and are ornamented in an attract-

ive style. Numerous varieties are produced, several of which are illustrated. The leading cooks are the Adelbert Jewel, Adelbert Home and Adelbert Hayden. The heaters are represented with the Adelbert oak in the leading place. This is richly ornamented, has an all cast body and is well mounted and cemented. The Adelbert Cosy is a pretty Franklin stove, with circular fire pot, and adapted for burning hard or soft coal, coke or gas. Egg and cannon stoves are also shown.

THE MICHIGAN STOVE COMPANY favor us with one of their new portfolio pocket envelopes, intended for use in carrying papers. It is sufficiently large to hold legal documents. The Garland trade-mark is visible on it, but nothing else in the nature of an advertisement of the company. On the inside of the flap is a table showing the population of the leading cities and another showing the population of the States. Blanks are arranged also for the insertion of identification details. Circulars have also been received from the same company referring to their specialties. One is entitled "Fact *vs.* Fiction," and is an array of arguments to prove that Garland stoves and ranges are not too high priced for certain markets, and that in fact there is no place in the world where stoves are used but that Garlands can be sold. Another circular illustrates and describes the Carbon Garland parlor heater, for soft or hard coal, and the Maple Garland base heater for wood. The Carbon Garland is described as a "parlor furnace" on account of its heating qualities, while the Maple Garland is offered at the request of numerous customers for a strictly first-class base heating wood stove. The wood burns upon the bottom instead of a grate, bringing the heat nearer the floor than if a grate was used.

THE WESTERN STOVE MFG. COMPANY, St. Louis, who have been closed down for some time past, will resume operations on July 2.

A GORY RED is the color adopted by Bergstrom Bros. & Co. of Neenah, Wis., for both the envelope and cover of a 16-page catalogue which they have just issued. It relates principally to the Elmhurst surface burning parlor stove. Reference is made to its beauty of design and ornamentation, heating capacity, economy of fuel, convenience, durability and medium price. It has been on the market for 12 years, yet has been often changed, always bettered, and this year it is entirely new in ornamentation and interior arrangement. Hot air flues have been added to increase its heating capacity. It has also full side and base flues, giving greater radiating surface, also a new device in the nature of a gas flue to consume the gas forming over the fire. Large sizes are made for heating halls and churches. Several pages of testimonials from enthusiastic users are printed. Some points are given with reference to the Royal Oak made by this firm. It also has a large air heating flue, and is constructed with a view to durability and practical value as well as ornamentatal appearance.

C. S. REYNOLDS & Co., Columbus, Ohio, have just completed a new line of cook stoves and ranges, which they are offering under the name Noonday. Two sizes are made for burning wood and two sizes for coal. The latter is offered with pouch or side feed and is furnished as a four or six hole range, made square and with or without reservoir. The company have also brought out a new cheap cook stove, intended for using coal or wood, and which is known as the Crystal Noonday. This is also made in two sizes, Nos. 8-18 and 8 20 being designed for coal and Nos. 8 20 and 8 22 for wood. The Noonday series are of the latest design, attractively decorated and embody the modern improvements.

THE RINGEN STOVE COMPANY of St. Louis, Mo., send us an illustrated circular of Quick Meal torches and lamps for gasoline, which are offered in several sizes. The construction of the Quick Meal torch is said to be simple, its flame bright and clear, and the device specially adapted for use in foundries, machine shops, factories, &c. The circular also illustrates the Quick Meal furnaces for gasoline designed for plumbers' and tinners' use, tailors' establishments, &c.

CHARLES D. SCOTT, successor to Weaver & Cheyney of 275 South Third street, Philadelphia, sends us circulars illustrating some of the goods for which he is sole agent. Among these may be mentioned the Warren five-hole brick set range and the Splendid fire place heater, both made by the Fuller & Warren Company of Troy, N. Y. We also have a pamphlet illustrating and describing the Automatic hot air furnace, which is made of both cast and wrought iron with a broad shallow fire pot, revolving grate bar and automatic damper, which regulates the draft of the fire by the expansion and contraction of a brass tube. This automatic damper, or governor, is fully described and illustrated, as is also the Weaver & Volkmar range, which is made in three sizes. Several pages of the pamphlet are given up to the names of customers who have for years been using some of these specialties.

J. B. BORDEN of F. M. Borden & Bro., Philadelphia, spent last week in Baltimore, doing a satisfactory business in gas and gasoline stoves and refrigerators.

A VAPOR STOVE comprising a low down tank, an expansion chamber having a burner cap with an induction tube extending across the center of the chamber, an initial burner separated from the expansion chamber by a shield, a fluid supply pipe leading from the tank, a vapor controlling valve and a separate valve to control the flow of the fluid to the initial burner has recently been patented by Henry Ruppel of the Dangler Stove & Mfg. Company of Cleveland, Ohio. In the present construction the inventor has done away with the necessity of pressure in the oil supply pipe, this being accomplished by the peculiar construction of the burner. This has, as the basis of the principle upon which it is constructed, means for expanding the vapor and air after passing into the burner, and consists of a mixing chamber or drum, which is entirely closed excepting where it is penetrated by the air and vapor supply tube and at its top, where it is covered by the burner cap. The tube passes very nearly across the drum, so that the commingled air and vapor therein, after entering in a cool state, is exposed to the radiated heat of the burner and thereby expanded, so as to produce an outward pressure through the burner cap. This, it is claimed, promotes a steady and even flow of vapor to the flame while maintaining a uniform pressure. A noticeable feature of the stove is that the oil is delivered practically direct from the tank to the burner by a most simple construction and without the intervention of anything to alter or affect the transmission of the oil except the exposure of the oil duct to the heat of the burner and the pipe for mixing the air and vapor.

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TRADE REPORT.

The Iron Market.

The Coke situation continues very puzzling. It was expected that the men would return to work early this week, but they have not done so. One of the leading operators is quoted as saying that there will be some serious disturbances before the majority of the plants are again at work. The largest producer seems to be making no efforts comparable in earnestness with those during a similar contingency in former years. It is reported that this same interest is trying to buy some Coke and is also in the market for Bessemer Pig. Yet the same interest is supplying Eastern concerns with the required quota of Coke.

Rumor has it that Steel Billets from the Chicago district have sold for Cleveland delivery. Operators are acting conservatively, and are not offering the inducements to buyers which they would quickly do if the situation were fairly clear.

In the Wire trade the season is pretty well over, so that the demand for Rods and for Wire Billets will be light for some time to come. Rumors are afloat that a large German manufacturer has consigned a considerable quantity of Barb Wire to this country, to remain in bond in anticipation of the passage of the tariff bill, with its provision making Fencing Wire free.

Charcoal Pig Iron has drifted into a frightful condition. We understand that Lake Superior Car Wheel is being offered at $13.50, Buffalo, while Southern Iron has gone as low as $15, delivered, Boston.

Pig Iron.—In the New York market local agents report only a very moderate demand and complain that low prices continue to be made by some of the furnaces. Charcoal Iron has been selling at very low prices lately. Sales in this vicinity of Lake Superior Car Wheel Iron have been made on the basis of $13.50, Buffalo, while Southern Car Wheel has been offered at $15, delivered at Boston. We note below the result of the auction sale. There is still some demand for spot Bessemer. Ohio Irons are weaker. We quote standard brands $12.50 @ $13 for No. 1; $11.25 @ $12 for No. 2, at tidewater. Southern Iron, same delivery, $11.50 @ $12.25 for No. 1; $10.50 @ $11 for No. 2; $10 @ $10.25 for No. 3; $10.25 @ $10.75 for No. 2 Soft, and $10.50 @ $11 for No. 1 Soft. Foundry No. 4 (Foundry Forge) is $9.75 @ $10.25.

In some respects the Philadelphia Pig Iron market is improving. There is plenty of Iron at quoted rates, but there is none to be had at concessions, and some brands are firmly held at outside figures. Averaging the market all around, it may be said that while it is very dull, the undertone of firmness is greater than appears on the surface, which would be quickly shown on the slightest indication of a better demand. At present things could hardly be more lifeless, but general quotations for Philadelphia and near by points remain about as follows:

Standard No. 1 Foundry X	$12.50 @ $13.00
Standard No. 2 Foundry X	11.50 @ 12.00
No. 2 Plain	10.75 @ 11.00
No. 1 Soft	11.50 @ 11.75
No. 2 Soft	10.75 @ 11.00

Sales of local Coke Iron in Chicago have been fully up to previous weeks. Agricultural implement manufacturers are placing their season contracts for Pig Iron freely, and there are plenty of others who have not yet covered their requirements. Prices might be expected to advance under these circumstances, but furnace companies are still sharply competing for business and this keeps values down to their old range. Southern freight rates are to be advanced 25¢ on the 1st and quotations are changed accordingly. A fair demand is noted for soft grades for quick shipment, but there is little inquiry for deliveries extending over any considerable period. Some of the large Southern companies have withdrawn from the market altogether and are not making quotations on any grades. Quotations are given as follows for cash:

Lake Superior Charcoal	$15.00 @ $15.50
Local Coke Foundry, No. 1	11.25 @ 11.50
Local Coke Foundry, No. 2	10.50 @ 11.00
Local Coke Foundry, No. 3	10.00 @ 10.50
Local Scotch	11.50 @ 11.75
Ohio Strong Softeners No. 1	13.00 @ 13.50
Southern Silvery, No. 1	..... @ .....
Southern Silvery, No. 2	..... @ .....
Southern Coke, No. 2	10.50 @ 10.75
Southern Coke, No. 3	10.25 @ 10.50
Southern, No. 1, Soft	10.50 @ 10.75
Southern, No. 2, Soft	10.25 @ 10.50
Tennessee Charcoal, No. 1	..... @ .....
Tennessee Charcoal, No. 2	..... @ .....
Alabama Car Wheel	17.50 @ 18.00
Jackson County Silvery	15.00 @ 16.00

The Pittsburgh Pig Iron market is reported as extremely quiet, there being very little doing, either in spot Iron or for forward delivery. Foundry Iron is almost entirely neglected; consumers who heretofore bought in 100 and 200 ton lots now place their orders for a carload or two. In spite of the light demand prices are rather firm, there being little disposition to shade in order to get business. For deliveries during the next two or three months we quote as follows:

No. 1 Foundry	$11.50 @ $11.75, cash.
No. 2 Foundry	10.75 @ 11.00 "

In Southern markets, as reported from Cincinnati, supplies of Foundry Coke Iron are so nearly exhausted that any one who has any Iron to sell can readily obtain an advance of 25¢ ℔ ton for No. 1 Soft, No. 2 and No. 3. The demand while not large exceeds the offerings, and quotations are not much better than nominal. There is more urgency than ever before to have Iron delivered on contracts long past due, and in fact in most cases such demands cannot be complied with. This throws current consumers on the market to buy what they must have. The demand, therefore, especially for No. 1 Soft and No. 2 Soft, is far in advance of the ability of the furnaces to supply. There is some inquiry for round lots of Foundry Iron, but as no one wishes to contract ahead no prices are made. The market is in a demoralized condition. There is no movement in Charcoal Iron. Quotations are as follows:

Southern Coke, No. 1	$10.25 @ $10.50
Southern Coke, No. 2	9.50 @ 9.75
Southern Coke, No. 3	9.25 @ 9.50
Ohio Soft Stone Coal, No. 1	14.50 @ 15.50
Ohio Soft Stone Coal, No. 2	14.00 @ 14.50
Lake Superior Coke, No. 1	12.50 @ 13.00
Lake Superior Coke, No. 2	11.50 @ 12.00
Hanging Rock Charcoal, No. 1	17.00 @ 17.50
Hanging Rock Charcoal, No. 2	16.50 @ 17.00
Tennessee Charcoal, No. 1	13.00 @ 13.50
Tennessee Charcoal, No. 2	12.00 @ 12.50
Standard Southern Car Wheel	16.25 @ 17.00
Lake Superior Car Wheel and Malleable	16.25 @ 16.75

Advices from Birmingham, Ala., indicate that sales have been quite brisk and shipments exceeded the make largely. There are but few grades to be had there One large concern have nothing but No. 1 Foundry on hand and ten days' shipments will clean them up. Nos. 1 and 2 Soft are very scarce, as are in fact all the lower grades. Higher prices are looked for inside of 60 days. Quotations range No. 1 Foundry, $8; No. 2, $7 @ $7.25; No. 3, $6.75.

Metal Market.

Pig Tin. — On market prices of Straits Tin there has been a decline during the week of nearly ½¢ ℔ lb for delivery this month, July or August. Sales to consumers have not, however, been above a very ordinary average for this season of the year, and jobbing prices for small lots have ruled about the same as last week's quotations—namely, 20½¢ @ 21¢ ℔ lb. Slow trade here and lower prices in London along with the large visible supply of the metal account in a good measure for the decline in wholesale prices.

Copper.—The market has remained extremely quiet. The demand from all quarters has been unusully slow, and hardly enough business has been done to fairly determine market values. Jobbers' prices for small lots of Lake Ingot remain unchanged at former quotations, but the cheaper classes are to be had at some concessions.

Sheet Copper. — The demand for Sheet Copper has shared in the extreme dullness which pervades the Metal trade generally. Sales have been below the average, and inquiries limited in volume. Prices remain steady at their former level.

Pig Lead.—The proposed reduction in duty on foreign Lead has prompted the offering of domestic at a slightly lower figure than last week's quotations. Little business is doing, however, consumers being evidently inclined to go slow in the matter of buying until the tariff is settled. Deliveries are somewhat backward, and that fact tends to strengthen the belief in recent reports of restricted production. Jobbers ask for small lots of American Pig from 3⅝¢ to 3⅞¢ ℔ pound.

Lead Pipe and Sheet.—There is next to nothing doing in Manufactured Lead, inquiries and sales being alike confined to very moderate proportions. Prices were revised last week, and remain firm at the reduced rates.

Spelter.—Sales have been moderate. The demand has shown very little spirit, although probably better than during the fortnight preceding the week under review. A certain amount

of reserve in the offering was shown, the inference from which is that late reports of modified production have some basis. Prices are firm, the common rate asked by jobbers for small amounts of Western being 4¼¢ ℔ lb.

Antimony. — Dealings have been moderate, and prices are barely steady. For small lots jobbers' rates are about 10¾¢ for Cookson's and 10¢ for Hallett's.

Tin Plates.—The Tin Plate market has proved no exception to the rule of apathy which has characterized the Metal trade in general during the week. In the earlier days business was like that of last week—spasmodic and below the average for the season—but toward the end of the week it relapsed into absolute tameness. No improvement has developed in the demand for either spot or forward shipments. Consumers are pursuing the policy of the greatest caution in buying, and as a general rule order not a box beyond the exact quantity necessary to fill their current requirements. Reports of better values in the English markets have not affected the domestic market to any appreciable extent. Stocks of imported Plates in bond are ample for the present demand in nearly all lines. Prices remain almost stationary, but with rather soft undertone on spot goods.

A special London cable despatch to *The Iron Age* of June 27 reports as follows in regard to the British Tin Plate market: The demand for Coke Tin Plate has been moderately active, with good orders from 'Frisco at somewhat enhanced prices. Buyers and sellers are still so far apart that business is chiefly of a retail character. Ternes have been in good demand, but prices show no further change. Swansea prices are as follows:

Bessemer Cokes, 14 x 20	@ 10/3
Siemens Cokes, 14 x 20	@ 10/6
Ternes, double box	@ 19/
Charcoals	13/ @ 15/

Sheet Iron.—Notwithstanding the restriction of production in both Black and Galvanized Iron, owing to the closing down of many mills from lack of fuel, strikes, &c., the supply of Sheet Iron, except in the case of Black Sheets for tinning, appears to be fully adequate to the demand, which is reported as very moderate. Prices are still down to rock bottom and show, as yet, no rising tendency. Galvanized Iron in small lots from store is quoted at 75 @ 75 and 5 % off.

Chicago Report.

Scrap.—Dealers continue to quote the following list of buying prices, Chicago delivery:

	Per net ton.	Per lb
No. 1 Wrought Scrap	$7.00	....
Machinery Cast	6.00	....
Malleable Cast	5.00	....
Stove Plate (free of burnt)	4.00	....
Burnt Iron and Grate Bars	3.00	....
Sheet Iron and Hoops	2.00	....
Plow Steel and Breaking Stock	4.00	....
No. 2, such as Shovels, Hoes, &c.	3.00	....
Old Boilers—whole (Iron)	3.00	....
" (Iron)—cut in single Sheets and Rings	5.00	....
Old Gas-Pipe and Boiler Tubes	5.00	....
Cast Borings	3.00	....
Turnings	4.00	....
Horseshoes	8.00	....
Copper Bottoms	....	5½¢
Copper Clips and Heavy	....	7 ¢
Heavy Brass	....	5½¢
Light Brass	....	3 ¢
Pipe Lead	....	2¼¢
Tea Lead	....	2 ¢
Zinc	....	2 ¢
Rubber	....	3½¢

Anthracite.—Business is beginning to improve again. Carload lots of 12 net tons or over are quoted as follows:

	Grate.	Egg, Sto. and Cb
Chicago, Ill	$5.25	$5 50
Milwaukee, Wis	5.25	5.50
Kansas City, Mo	8.45	8.70
Council Bluffs, Iowa	8.45	8.70
Lincoln, Neb	8.60	8.85
Sioux City, Iowa	8.45	8.70
Aberdeen, S. Dak	8.50	8.75
Dubuque, Iowa	6.55	6.80
Madison, Wis	6.75	7.00
St. Paul, Minn	7.75	8.00
Burlington, Iowa	6.75	7 00
Des Moines, Iowa	8.20	8.45
Davenport, Iowa	6.55	6.80
St. Joseph, Mo	8.45	8.70
Leavenworth, Kan	8.45	8.70
Omaha, Neb	8.45	8.70

Colorado Anthracite.

COLORADO FUEL & IRON COMPANY.

Denver	$8.00
Pueblo	8.00
Colorado Springs	8.00
Leadville	8.00
Cheyenne, Wyo	10.00
All points between Denver and Missouri River	8.85

Trade Notes.

THE CANADIAN MINERAL WOOL COMPANY of Toronto, Canada, have secured a suitable factory at Dundas, Ontario, where they will have the necessary facilities for making the crude material which they have heretofore imported from the United States. The slag which they use will be brought from the Iron blast furnaces at Tonawanda, N. Y., until the blast furnace now being built at Hamilton, Ontario, is put in operation. The company are reported as enjoying a large sale for their mineral wool.

THE EXCELSIOR STEEL FURNACE COMPANY, 38 West Monroe street, Chicago, take up the subject of Register Flanges in their advertisement in this issue. Cuts are printed of both Square and Circle Top Flanges. These are made in all sizes and in both IC and IX weights. They are manufactured by special machinery built for the purpose and patented.

IN OUR ADVERTISING COLUMNS the Geuder & Paeschke Mfg. Company of Milwaukee, Wis., call attention to their line of Coal Hods, which they make in all sizes and styles, open or with funnels, japanned or galvanized and with gold bands or fancy decorations, as may be desired. The Hods have been entirely remodeled for this year's trade, are of pleasing design, very durable and are offered at prices which cannot fail to attract purchasers. All inquiries receive prompt and courteous attention.

It is reported from Boston that 300 acres on the Mystic River have been bought by New York capitalists, and that substantial docks will be built along the whole distance of the water front—1½ miles—where there is now a depth of 28 feet at low tide and of 37 feet at high tide. It is further rumored that the Nova Scotia Coal Syndicate will make the new docks their central depot for the United States.

The promptness with which the monthly statements of the imports and exports of the United States are now issued by the Treasury Department is much appreciated by the business community. The promulgation of early information on this subject adds much to its value.

CONDITION OF THE

Hardware Trade.

THE CLOSING DAYS of June are probably among the most quiet of the year, and, as is to be expected, the volume of business is light. Travelers for the most part are at home, some of them making arrangements to re-enter the field early next month. Merchants are as a rule buying only such goods as they require, and as a consequence both manufacturers and jobbers report business very light. Many of the factories are preparing to shut down for a time, as usual, in order to enable them to make repairs and improvements and get in shape for fall business. There is little to report in prices, the market being in substantially the same condition as for some time past. Collections are referred to as fair, though in some sections there is more or less complaint.

Advices from Chicago.—Trade in Shelf Hardware is not so active. Midsummer dullness appears to have made its appearance, and packing rooms are considerably quieter than they have been. No special changes have occurred in prices and no features of any special importance are coming up. Roofing plates are now in good supply, as importers have recently increased their stock considerably. Trade in Heavy Hardware has been good the whole of this month, but the past week's business was remarkably active. Small consumers have been buying very freely ; orders have not been large, but numerous. The demand for wagon and carriage stock is steady and much better than usual, and many houses are behind their orders. It is worthy of note that in this line the demand is running to a better grade of material than ever before. Consumers are asking for better stock and superior finish and manufacturers and jobbers are obliged to comply with their wishes.

Notes on Prices.

Wire Nails.—The market in the matter of price is not entirely even. Some manufacturers are holding firmly at $1.10 for carload lots at mill, but others are making $1.05, and it is rumored that in some cases the latter figure has been slightly shaded. The demand is only moderate and the mills are beginning to close down. Small lots from store in New York are held at $1.25 to $1.30.

Advices from Chicago.—Manufacturers report trade quiet during the past week. A few orders have been influenced by the prospects of a general shut down of the factories on July 1, but merchants are not at all disposed to buy freely. Prices are maintained at $1.20 to $1.25, Chicago, for factory lots, while small lots are selling at $1.25 from stock.

Cut Nails.—There has been little change in the Cut Nail market during the past few weeks, and it is still represented by the quotation of 95¢ to $1 for carload lots, delivered on dock in New York, but during the past week the former figure has been made a little more freely than heretofore. Some relatively low quotations have been made by Western mills who are desirous of placing goods in Eastern territory, and this competition has the effect of weakening the market somewhat. Small lots from store in New York are held regularly at $1.10 to $1.15.

Advices from Chicago.— Prices on factory shipments have been increased

to 95 cents on a 55-cent average from the local mill. The manufacturers are doing a good business and not complaining of its volume, but Eastern manufacturers appear to be getting absolutely nothing in this field. The Lakeside mill is still shut down, but the company expect to start at an early day, as soon as a supply of coal can be obtained. Small lots from stock are quoted by jobbers at $1.15.

Barb Wire.—As usual at this season, the demand is light and diminishing. Prices, which of late have been a little uneven, show signs of increasing weakness, and slightly lower quotations are made. It is probable that attractive orders could be placed at lower prices than have recently ruled. We quote for Four-Point Galvanized, delivered at the points named, as follows: Pittsburgh, $2.05 to $2.10; Cleveland, $2.10 to $2.15; Cincinnati or Allentown, $2.25 to $2.30; Chicago or New York, $2.25 to $2.30.

Advices from Chicago.— Manufacturers have lately been accumulating stock, as they are now soliciting orders with guarantees of prompt shipments. While trade is light, there has been no change in prices. Factories will generally shut down July 1, and consequently it is expected that they will be able to maintain quotations for some time. Jobbers quote small lots of Galvanized at $2.35 to $2.40, while carloads are selling at $2.20 to $2.25.

Enterprise Grater No. 93.—This article is put on the market by the Enterprise Mfg. Company of Pennsylvania, Philadelphia, Pa., for whom J. C. McCarty & Co. are agents, 97 Chambers street, New York. The Grater is sold at $3 list, subject to a discount to the trade of 20 per cent.

Juice Extractor No. 21. — Enterprise Mfg. Company of Pennsylvania, Philadelphia, Pa., for whom J. C. McCarty & Co., 97 Chambers street, New York, are agents, are putting this article on the market. It is sold to the trade at $2.50 list, subject to a discount of 20 per cent.

Monitor Aluminum Juice Extractor. — This Extractor is manufactured by the Sterling Aluminum Company, 1195 Fulton street, Brooklyn, who are selling it to the trade at $5 per dozen, net. The company are selling Glass Extractors of the same pattern at 85 cents per dozen, net. Referring to the use of aluminum in lemon juice extractors, the company advise us that they have recently received a letter from Prof. James W. Richards of Lehigh University, in which he states that aluminum is a better material than glass for this purpose.

Ideal Dampers.—An illustrated description of these goods, which are a recent addition to the manufactures of the Stover Mfg. Company, Freeport, Ill., was given in our issue of 16th inst. These Dampers are sold to the trade at a discount of 50 per cent. from the following list:

4	4½	5	5½	6	7	inch.
$1.00	$1.13	$1.25	$1.38	$1.50	$2.00	per doz.

Glass.—The demand for Glass during the past week has not shown the activity anticipated by the manufacturers. Buyers are pursuing a conservative policy and purchasing only for immediate requirements, as the outlook does not justify anticipating the future. Glass factories not already closed down will discontinue operations on June 30 for the summer, and the opinion is expressed that the accumulated stock will be insufficient to supply the demand until fall. It is estimated that if the tariff bill passes in its present form foreign Window Glass can be imported at a discount of 88 per cent., and that the foreign article would then become a sharp competitor of American Glass. The general tendency of the market is still firm, Pittsburgh factory quotation being 85 per cent. discount. The demand for American Plate Glass is reported as encouraging at 70 and 10 per cent. discount.

Old Metals.—Business in Old Metals shows but very little more activity. Rather more inquiry for certain varieties of Scrap Iron is noted, and a few fair sales have been made, but they have not been sufficient to affect prices, which continue low. The following quotations represent about the current prices paid by New York dealers:

Heavy Copper	℔	6¾¢
Light and Tinned Copper	℔	6 ¢
Heavy Brass	℔	4½¢
Light Brass	℔	3¾¢
Lead	℔	2½¢
Tea Lead	℔	2¼¢
Zinc	℔	2 ¢
No. 1 Pewter	℔	12 ¢
No. 2 Pewter	℔	6 ¢
Wrought Scrap Iron	gross ton	$8.00
Heavy Cast Scrap	gross ton	7.00
Stove Plate Scrap	gross ton	3.50
Burnt Iron	gross ton	2.50

Old Rags, Paper, &c.—The market for these materials continues very quiet and prices rule low. The following are the current rates paid in New York:

No. 1 White Rags	℔	3¼	@	3½¢
No. 2 White Rags	℔	2	@	2¼¢
Mixed Rags	℔			¾¢
Blues and 3ds	℔	1	@	1¼¢
Hard Sized White Shavings	℔	2⅛	@	2¾¢
No. 1 White Book Shavings	℔	1¾	@	2⅛¢
No. 2 White Book Shavings	℔	1⅛	@	1½¢
Light Book Shavings	℔			¾¢
No. 1 Mixed Shavings	℔	1	@	1¼¢
No. 2 Mixed Shavings	℔	¾	@	1 ¢
No. 1 Printed Books	℔	1	@	1¼¢
Ordinary Mixed Books	℔	⅛	@	¾¢
Newspapers	℔			2-5¢
No. 1 Manila Paper	℔	¾	@	1 ¢
No. 2 Manila Paper	℔	⅞	@	¾¢
Bogus Paper	℔			⅛¢
Common Paper	℔			⅜¢
Straw Chips	℔			½¢
Binders' Clippings	℔			½¢
Jute Butts	℔			1⅞¢
No. 1 Jute Bagging	℔			1 ¢
Mixed Bagging	℔	¾	@	1 ¢
No. 2 Bagging	℔	⅛	@	¾¢
Hemp Twine	℔	2	@	2¼¢
Manila Rope	℔	2⅛	@	2¼¢
Jute Rope	℔	1⅛	@	1¾¢
Mixed Rope	℔	¾	@	⅞¢

Old Rubber.—There has been quite a marked improvement in the market for Old Rubber in this section, and prices have advanced for some descriptions. Dealers' purchasing prices, New York delivery, are as follows:

Car Springs, ton lots, ℔	@	$0.03½
Rubber Shoes, carloads, delivered at factory, ℔	@	.04⅜
Rubber shoes, less than carloads, ℔	@	.04
Large Hose, ℔ ton	@	15.00
White Wringer Rolls, ℔	@	.03¾
White Syringes, ℔	@	.03¾

Overhead electric wires in the crowded parts of Boston have been ordered down and to be placed underground. This order affects the street railway, telegraph, telephone and electric light companies, who are given until November next to complete the work.

It is reported that the New Hampshire Legislature will consider a proposal to build an electric road through the entire length of the State, beginning at Haverhill and terminating at Quebec, Canada.

Gasoline Soldering Furnace.

The Henrie Mfg. Company, Xenia, Ohio, are introducing to the trade an improved gasoline soldering furnace, shown in the accompanying illustration. Among the especial features of merit claimed for it by the makers is that the needle point is so guarded and arranged that draft cannot blow the gas away from the mixing chamber. It is also pointed out that it has what is termed return burners, which burn equally on both sides of heating chamber. Furthermore, its construction provides exceptionally large space for heating, and is especially adapted for cross seam or bottom irons on this account. For plumbers' service it is arranged so that no additional expense is necessary for hood or other device. When it is desired to melt solder a movable cap and loose ring are removed from the top of the heating hood and the pot placed thereon. The cast iron return burners



Gasoline Soldering Furnace.

are so arranged that solder cannot clog them, while they burn from both sides evenly, the flames meeting in the center, producing a very hot fire. The furnace will melt lead and heat coppers at the same time, the burners being large enough to heat three irons at once.

The members of the New York and New Jersey Bridge Commission, recently nominated by the President, held their initial meeting in the Army Building, New York, on Monday. The commission is composed of the following members: Major C. W. Raymond of the Corps of United States Engineers; Theodore Cooper and Prof. W. H. Burr of Columbia College, New York; George H. Morrison, Chicago, and G. Bouscaren, Cincinnati, Ohio. Major Raymond was elected president of the board and Mr. Cooper secretary. Charles Swan, secretary and treasurer of the Bridge Company, appeared before the board and presented the bridge plans, which will be taken into immediate consideration by the commission, whose first duty will be to determine the length of the new bridge's span.

United States Consul-General Ramon Williams, at Havana, reports to the State Department that a cablegram received there from Madrid states that the budget presented to the Spanish Cortes by the Colonial Minister of Cuba, to go into force on July 1, imposes a temporary import duty of 24 per cent. on all articles of American production now exempted by Schedule A of the reciprocity agreement between Spain and the United States.

Metal and Miscellaneous Prices.

CHICAGO, JUNE 28, 1894.

Tin—

Straits pigs.....21½¢

Imported Tin Plates—

Charcoal Plates.—Bright.

Guaranteed Plates command special prices, according to quality.

		Per box.
Oalland and MelynGrade	IC, 10 x 14	@ $6.75
	IC, 12 x 12	@ 6.75
	IC, 14 x 20	@ 6.75
	IC, 20 x 28	@ 13.50
	IX, 10 x 14	@ 8.75
	IX, 12 x 12	@ 8.75
	IX, 14 x 20	@ 8.75
	IX, 20 x 28	@ 17.50
	DC, 12½ x 17	@ 6.50
	DX, 12½ x 17	@ 8.50
Allaway Grade,	IC, 10 x 14	@ 6.35
	IC, 12 x 12	@ 6.35
	IC, 14 x 20	@ 6.35
	IC, 20 x 28	@ 12.70
	IX, 14 x 20	@ 7.85
	IX, 20 x 28	@ 15.20

Coke Plates—Bright.

	Per box.
Steel Coke—IC, 10x14, 14x20	@$5.60
IC, 14x20.90 ℔	@ 5.35
IC, 14x20, 100 ℔	5.50 @ 5.65
10 x 20	@ 8.50
20 x 28	11.30 @11.50
IX, 10x14, 14 x 20	@ 7.25
B.V. Grade. IC, 10x14, 14x20	5.75@ 5.85

Charcoal Plates.—Terne.

Guaranteed Plates command special prices, according to quality.

Mansel and Dean Grades.—	
IC. 14 x 20	@ $5.50
20 x 28	@ 11.00
IX. 20 x 28	@ 14.00
Worcester Brand and equal.—	
IC, 14 x 20	6.12½@ .....
IC, 20 x 28	12.25 @ .....
IX, 14 x 20	7.62½@ .....
20 x 28	15.25 @ .....

Tin Boiler Plates.

	Per box of 100 sheets.	Per box of 112 sheets.
X, 14 x 28	$13.00	$13.00
XX, 14 x 28	14.50	14.50
X, 14 x 31	14.50	15.80
XX, 14 x 31	16.50	17.50
		Per box of 56 sheets.
X, 14 x 56	29.50	16.50
XX, 14 x 56	32.50	18.20
X, 14 x 60	31.50	17.65
XX, 14 x 60	35.50	20.00

American Tin Plates.

Charcoal Plates.—Bright.

Florence.—
IC, 10 x 14, 12 x 12, 14 x 20 ..$6.75
IX, 10 x 14, 12 x 12, 14 x 20 .. 8.50

Palma.—
IC, 10 x 14, 12 x 12, 14 x 20 ..$7.00
IX, 10 x 14, 12 x 12, 14 x 20 .. 9.00

Each extra cross $2.00 and 20 x 28 double these prices.

Brilliant, Tissue Packed, IC, 14 x 20 .$9.25
Royal extra. IC, 14 x 20 ..... 7.25
Merion, IC, 14 x 20 ..... 7.00
Almond, IC, 14 x 20 ..... 6.50
Mint, IC, 14 x 20 ..... 6.25

Coke Plates.—Bright.

Elwood.—IC, 14 x 20 .....$6.00
IC, 20 x 28 .....12.50

Roofing Plates.

Palm, IC, 20 x 28 .....@$11.50
Palm, IX, 20 x 28 .....@ 14.00
Empire, IC, 20 x 28 .....@12.00
Empire, IX, 20 x 28 .....@15.00
Hickory, IC, 20 x 28 .....@ 12.50
" IX, 20 x 28 .....@ 15.50
Alaska (heavily coated), IC, 20x28 @$14.50
Alaska IX, 20 x 28 .....@ 17.75
Special, IC, 20 x 28 .....@ 14.75
" IX, 20 x 28 .....@ 17.25

Westmoreland :
IC, 14 x 20 ..... $6.00
IC, 20 x 28 ..... 12.00

Elwood :
IC, 20 x 28 ..... $11 50

Kenwood :
IC, 20 x 28 .....$11.50

Furmston :
IC, 20 x 28 ....$11.00

Juno :
IC, 14 x 20 ..... $5.75
IC, 20 x 28 ..... 11.50

Illinois, Old Method :
IC, 20 x 28 .....$17.00

E. L. :
IC, 20 x 28 .....$12.50

Jessie :
IC, 20 x 28 .....$12.00

Scott's Extra Coated, Stamped and Resquared, IC, 14 x 20 ..... $9.50
Scott's Extra Coated, Stamped and Resquared, IX, 14 x 20 .....11.00
Scott's Extra Coated, Stamped and Resquared, IC, 20 x 28 .....19.00
Scott's Extra Coated, Stamped and Resquared, IX, 20 x 28 .....22.00
Neville, Stamped, IC, 14 x 20 ..... 6.25
" " IX, 14 x 20 ..... 7.50
" " IC, 20 x 28 .....12.50
" " IX, 20 x 28 .....15.00
Taylor's Old Style, IC, 14 x 20 (Stamped and Resquared) $9.50
Taylor's Old Style, IC, 20 x 28 (Stamped and Resquared) 19.00
Taylor's Roofing, IC, 14 x 20 (Stamped and Resquared) 8.25
Taylor's Roofing, IC, 20 x 28 (Stamped and Resquared) 16.50
Columbia, IC, 14 x 20 (Stamped) 7.25
" IC, 20 x 28 (Stamped) 14.50
Maple, IC, 14 x 20 (Stamped) 6.75
" IC, 20 x 28 (Stamped) 13.50
Willow, IC, 14 x 20 ..... 6.50
" IC, 20 x 28 .....13.00
Knoxall, IC, 14 x 20 ..... 6.25
" IC, 20 x 28 .....12.50
Globe, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ....12.00
Miami, IC, 14 x 20 ..... 6.00
" IC, 20 x 28 ....12.00
" IX, 20 x 28 .....15.00
" (Redipped), IC, 20 x 28 .....17.00

Old Process :
IC, 14 x 20 ..... 9.00
IX, 14 x 20 .....11.00
IC, 20 x 28 .....18.00
IX, 20 x 28 .....22.00

H. B. L., Old Style :
IC, 14 x 20 ..... 7.75
IX, 14 x 20 ..... 9 25
IC, 20 x 28 .....15.50
IX, 20 x 28 .....18.50

Sheet Iron—

Black.

	Common American	Refined.
Nos. 10 to 16	℔ ℔ 2 3-10¢	3 1-10¢
17 to 20	℔ ℔ 2 4-10¢	3 2-10¢
21 to 24	℔ ℔ 2 5-10¢	3 3-10¢
25 and 26	℔ ℔ 2 6-10¢	3 4-10¢
27	℔ ℔ 2 7-10¢	3 5-10¢

Russia, Planished, &c.

Genuine Russia, all numbers....18¢ net.
Patent Planished....℔ ℔ A, 10½¢; B, 9½¢ dis. 5%
Craig's Polished Sheet Steel.....8½¢

Galvanized.

Juniata, or first quality.....dis. 75@5%

Copper—

Ingot.

Lake.....10¼¢ @ 10¾¢
Casting Brands..... 9¾¢ @ 10⅛¢

Sheet and Bolt.

Discount on old list (except advance on cold rolled polished boiler sizes to 25¢), 25%.

Copper Bottoms.

Discount on old list, 25%.

Seamless Brass and Copper Tubes.

Base price, 17½¢, Chicago, with extras according to size.

Copper, Bronze and Gilding Tube, 3¢ ℔ ℔ additional.

Brazed Brass Tubing. (100 ℔ lots.) (To No. 19 inclusive.)

Discount, 40%.

Plain, ¾ inch up to 2 inch.....$0.35
Plain, ⅝ inch up to ¾ inch..... .34
Plain, ½ inch up to ⅝ inch ..... .38
Plain, ⅜ inch up to ½ inch..... .41
Plain, 5-16 inch up to ⅜ inch..... .48
Plain, ¼ inch up to 5-16 inch ..... .65
Plain, 3-16 inch up to ¼ inch..... 1.00
Plain, ⅛ inch up to 3-16 inch..... 1.50
Plain, 2 inch up to 3 inch..... .38
Plain, 3 inch and larger..... Special.
Plain, smaller than ⅛ inch..... Special.
Bronze and Copper..... ℔ advance.

Roll and Sheet Brass. (100 ℔ lots.)

Discount, 40%.

Slab Spelter—

Western Spelter..... .....4¢

Sheet Zinc—

600 ℔ casks..... .....4⅝¢
800 ℔ casks,..... .....4⅞¢
Loose sheets..... .....5½¢

Lead—

Soft Pig Lead.....4 ¢
Bar.....4½¢
Pipe.....5½¢, dis. 10%
Block Tin Pipe.....35¢
Sheet.....6¢, dis. 10%

Solder—

½&½.....13¢
Extra Wiping.....11½¢

The prices of the many other qualities of Solder in the market indicated by private brands vary according to composition.

Antimony—

Cookson.....12½¢
Hallett's.....11½¢

Wrought-Iron Pipe—

1¼ and under, Plain.....57½%
1¼ and under, Galv.....50%
1½ and over, Plain.....67½%
1½ and over, Galv.....57½%
Boiler Tubes, list Oct. 24, 1892.....70&10%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...60%

Cast-Iron Soil Pipe—

Cast-Iron Soil-Pipe, Tarred; sizes 2 to 6 inches, inclusive.....dis 70&10%
Other sizes.....dis 60%

Leader Pipes—

Abendroth's Galv. Spiral Riveted.....55¢
Austin's Corrugated.....60%
Gordon & Gilbert's Corrugated.....60%
Ritchie's (Galv. Iron only) Cor'd.....60%
Ritchie's Spiral Lock Seam, Galv'd....55%
Austin's Spiral Ribbed Pipe.....60%
Plain Adjustable Elbows.....60%
James A. Miller Bros. (Galv'd Iron only) Corrugated.....60%

Furnace Fittings—

Discount from Excelsior Steel Furnace Co.'s list.....50%

Steel Roofing—

Perfection.....$3.50 square
Climax.....$3.35 square
The Lloyd Spanish Tiling....$4.50 square

Metallic Shingles—

Cushman's.....$1.50 square
Merchant & Co.'s Spanish Tiles :
Copper, 14 oz.....$36.00 square
Tin.....$9.75@$14.25 square
Steel, painted.....$9.00 square

Drain Pipe—*Tile.*

Discount from list.....70%

Paints, Oils, &c.—

Deodorized Benzine.....7¼@8 ¢
Iron Paint, Bright Red.....℔ ℔, 2 ¢
" " Brown.....℔ ℔, 1½¢
" " Purple.....℔ ℔, 2½¢
" Ground in oil, B. Red ℔ ℔, 6½¢
" Ground in oil, Red..℔ ℔, 6½¢
" Ground in oil, Brown ℔ ℔, 5½¢
" Ground in oil, Purple ℔ ℔, 6 ¢
Linseed Oil, Boiled, in bbls.....56¢@58¢
Linseed Oil, Raw, in bbls .....55¢
Mineral Paints.....2@4¢
Orange Mineral.....9¾¢
Pure White Lead in Oil.....6@6½¢
Dry White Lead in bbls.....5½@5¾¢
Red Lead, American.....6@6½¢
Red Venetian, English, dry...$1.65@$1.70
Red Venetian in oil; asst'd cans, 8½¢; kegs.....7½¢
Sipe's Japan Oil, in bbls. ℔ gal.....84¢
Spirits Turpentine, in bbls., ℔ gal 36¢ @36½¢
Asphaltum, Trinidad Refined, ℔ ton..$—
Tarred Felt, 1 Ply, ℔ 100 ℔.....$1.60
Tarred Felt, 2 Ply, ℔ roll 108 sq. feet.....$1.25
Tarred Felt, 3 Ply, ℔ roll of 108 sq. feet.....$1.70
Roofing Pitch, ℔ bbl. of 300 ℔.....$3.00

NEW YORK, JUNE 29, 1894.

The following quotations are for small lots.

Aluminum—

No. 1 Aluminum (guaranteed over 98% pure), in rolling ingots
Small lots.....℔ ℔, 65¢
100-℔ lots.....℔ ℔, 63¢
Ton lots.....℔ ℔, 60¢
No. 1 Aluminum (guaranteed to be over 98% pure), in ingots for remelting :
Small lots.....℔ ℔, 63¢
100-℔ lots.....℔ ℔, 60¢
Ton lots.....℔ ℔, 55¢
No. 2 grade (guaranteed to be over 94% pure Aluminum), cast in ingots for remelting :
Small lots.....℔ ℔, 60¢
100-℔ lots.....℔ ℔, 55¢
Ton lots.....℔ ℔, 50¢

Antimony—

Cookson.....℔ ℔, 10½¢
Hallett's.....℔ ℔, 10¢

Brass—

Planished.....net
Roll and Sheet.....25@30%

Brass and Copper Tubes

Brazed Brass Tubing—

Brown & Sharpe's Gauge the Standard.

List April 9, 1894.

Plain Round Tube.	Per ℔.
¼-in. up to 2-in	$0.35
⅜-in. up to ¾-in	.26
½-in. up to ⅝-in	.38
⅝-in. up to ½-in	.41
5 16-in. up to ⅜ in	.48
¼ in. up to 5-16 in	.65
3-16-in. up to ¼-in	1.00
⅛-in. up to 3-16-in	1.50
Smaller than ⅛-in.	Special
3 in. and larger	Special
2 in. to 3 in., to No. 16, inclusive,	.28

25 @ 30%

Copper and Bronze Tubing—

3¢ ℔ ℔ more than brass.

Conductors—

Corrugated. *Round or Square—*
Galvanized.....60%
Galvanized, Locked Joints.....60%
Tin.....60%

Spiral Riveted—

Galvanized.....50%

See also *Elbows and Shoes; Eave-Trough Miters; Strainers, Conductor.*

Conductor Strainers—See *Strainers, Conductor.*

Copper—

*Bottoms, Pits and Flats..*19¢ ℔ ℔, net
Ingot.

Lake.....10½¢
Ansonia Grade Arizona.....10 ¢
Ansonia Grade Casting.....9½¢
Planished.....net
Sheet and Bolt.....15¢ ℔ ℔, net, basis

Tubes—See *Seamless Brass Tubes.*

Eave Troughs—

Lap or Slip Joint, Galvanized.....60&10%
Lap or Slip Joint Terne.....60%

Eave-Trough Mitres—

Lap or Slip Joint.....list, net

Elbows—

Plain Adjustable—

Tin.....70%
Galvanized.....70%

Crimped Tubing—

Re-Tinned or Galvanized.....35%

Stove-Pipe—

Buffalo Four-Piece.

4¼	5	5½	6	7 inch,
$0.78	.87	.90	.99	1.20 per doz..20 %

Elbows and Shoes—

Flat Crimp.

Tin.....35%
Galvanized.....35%

Corrugated.

Flat Crimp.

Galvanized.....60%

Round or Square.

Tin.....60%
Galvanized.....60%

Iron, Sheet—

Black.

	Common American.	R. G. Cleaned American.
Nos. 10 to 16	℔ ℔, 2.50	2.80¢
Nos. 17 to 21	℔ ℔. 2.60	2.90¢
Nos. 22 to 24	℔ ℔, 2.70	3.00¢
Nos. 25 and 26	℔ ℔. 2.80	3.10¢
No. 27	℔ ℔. 2.90	3.20¢
No. 28	℔ ℔, 3.00	3.30¢
American B. B	℔ ℔, 4¢	@4½¢

Russia, Planished, &c.

Genuine Russia, according to assortment.....℔ ℔, 11½@12½¢
Patent Planished....℔ ℔, A, 10¢; B, 9¢, 5%
Craig Polished Sheet Steel.....℔ ℔ 8½¢

Galvanized.

	B. B.
Nos. 10 to 16	75@76&5%
Nos. 17 to 21	
Nos. 22 to 24	
Nos. 25 to 26	
No. 27	
No. 28	
No. 29	
No. 30	

Lead—

American Pig.....3⅝¢@3⅞¢
Bar.....4½¢
Pipe.....5½¢, 20%
Tin Lined Pipe.....15¢. 20%
Block Tin Pipe.....35¢. 20%
Sheet.....6½¢, 20%
Old Lead in exchange, 2¾¢ ℔ ℔.

Metal, Expanded—

Manufacturers' list No. 5.

Lathing.....10%
Fencing, Painted Sheets.....20%
Netting, Painted Sheets.....20%
Door Mats, Galvanized.....25%
Window Guards, Paneled.....15%
Tree Guards, Paneled.....15%

Mitres, Eave-Trough—See *Eave-Trough Mitres.*

Paints, Oils &c.—

Lead, Amn. White, in oil	6¾ @ 7 ½
Lead, Red, bbls. and ½ bbls	6½ @ 7
Lead, Red, kegs	6¾ @ 7
Ocher, American	1 @ 1½
Red Venetian, American	1½ @ 2½
Linseed Oil :	
Raw, ℔ gal	.. @ .50
Boiled	.. @ .53
Spirits Turpentine :	
In bbls	.. @ .36
Putty :	
In barrels and ½ bbls	.01½ @ .01¾
In tubs	.01½ @ .01¾
In tin cans	.01½ @ .02⅛
In bladders	.01⅝ @ .02¼

Roofing Material, &c.:
Asphaltum, Trinidad Refined, ℔ ton.....$30.00@$35.00
Asphaltum, Rock, ℔ ton..... $14.00
Coal Tar Felt, 1 Ply, ℔ ℔..... 2¢
Coal Tar Felt, 2 Ply, ℔ roll 108 sq. ft. $1.42½
Coal Tar Felt, 3 Ply, ℔ roll 108 sq. ft. $1.85
Roofing Pitch, ℔ bbl..... $2.25

Pipe, Drain 50%

Pipe and Fittings, Cast Iron Soil—

"Standard" Pipe, 2 to 6 inches..65&10%
Fittings, Pipe, " " 65&10&10%
Extra Heavy Pipe, " " 65&10&10%
Fittings, Heavy Pipe," " 65&10&10%
Large sizes of both kinds.....65&10%
Fittings for both kinds.....65&10%

Pipe, Spiral—

Galvanized.....60%
Tin.....60%

Rock and Slag Wool—

	₩ ℔	₩ cub. foot.
Slag Wool, ordinary....	1¼	15¢
Slag Wool, extra.....	4¼	38½¢
Rock Wool, ordinary...	2¼	27¢
Rock Wool, extra.....	7¼	43½¢

Rosin—

Common and Good—Strained
Rosin, C. & D.....₩ hhl. $1.42@$1.43
Rosin, E. & F..... ₩ bbl. $1.50@$1.75
Rosin, G. & H. .....₩ bbl. $1.90@$2.15
Rosin, I. & K.....₩ bbl. $2.45@$2 78
Rosin, M. & N.....₩ bbl $2.85@$3.10

Seamless Brass Tubes..net

Shoes and Elbows—See *Elbows and Shoes.*

Slate Roofing—

According to size, f.o.b. cars, Quarry Station.

Pennsylvania:
Best Bangor, ₩ sqr.....$3.25@$4.50
Pen Argyle, ₩ sqr..... 3.70@ 4.00
Peach Bottom, ₩ sqr..... 4.75@ 5.60
No. 1 Chapman, ₩ sqr..... 3.90@ 4.25
Lehigh Slates, ₩ sqr..... 3.00@ 4.50
Vermont:
Sea Green, ₩ sqr..... 2.50@ 2.75
Purple, ₩ sqr..... 8.50@ 4.50
Unfading Green, ₩ sqr..... 3.50@ 4.00
Red, ₩ sqr..... 9.75@12.00

Solder and Soldering Fluids—

Solder—

½& ¼..... 13¼@14¢
No. 1..... 11¼@12½¢
Prices of Solder indicated by private brands vary according to composition.

Soldering Fluids—

Concentrated Soldering Flux.

f.o.b. New York.

In barrels, ₩ ℔.....4¢
Smaller quantities, ₩ ℔.....5¢

Gedney's Soldering Fluid.

In carboys or barrels, ₩ ℔.....2¢
$1.50 for carboy or barrel; money refunded when returned.

Perfection Soldering Flux.
No charge for package.

Bbls., about 500 ℔, ₩ ℔.....3½¢
½ bbls., about 300 ℔, ₩ ℔.....4¢
Kegs, about 110 ℔, ₩ ℔.....4¢
75¢ extra for keg.
Kegs, about 55 ℔, ₩ ℔.....4¢
(5 sizes.)

Yager's Soldering Salts.

¼-℔ bottles, each.....30¢
Large quantities, per ℔.....40¢

Spelter—

Western Spelter.....4¼¢
Bertha (pure).....8¢@8¼¢

Spiral Pipe—See *Pipe, Spiral.*

Stove-Pipe Elbows—*See Elbows, Stove Pipe.*

Stove Trucks—See *Trucks, Stove.*

Strainers Conductor—

Galvanized.....60%

Tin, Pigs and Bars—

Banca, pigs, ₩ ℔..... 21½¢@22¢
Straits, pigs, ₩ ℔.....20½¢@21¢
Straits in bars, ₩ ℔.....21½¢@22¢

Tin Plates—

American Terne Plates—

Alaska (re-squared) IC, 14 x 20.... $7.00
Alderly, extra quality, IC, 14 x 20..6.37½
Allegheny, IC, 14 x 20..... 5.50
" IX, 14 x 20..... 6.75
Apollo Roofing, IC, 14 x 20..... 5.50
" " IX, 14 x 20..... 6.50
Atlantic, IC, 14 x 20..... 5.75
Bonus, Extra Coated, IC, 14 x 20.... 6.75
" " " IX, 14 x 20.... 8.25
Buckeye, IC, 14 x 20..... 7.00
" IX, 14 x 20..... 8.25
Chicago, IC, 20 x 28.....11.50
Central, IC, 14 x 20..... 5.37½
Climax, IC, 14 x 20 ..... 5.50
Columbia, IC, 14 x 20..... 7.00
Dane, IC, 14 x 20 ..... 5.50
DeMilt's First New York, IC, 14 x 20. 5.75
" First New Jersey, IC, 14 x 20 5.50
" Mohawk, IC, 14 x 20..... 5.50
Dunlap's Double Dipped, IC, 14 x 20 8.25
" " " IX, 14 x 20 9.50
" Domestic, IC, 20 x 28.....12.00
" " IX, 20 x 28.....15.00
Empire, IC, 14 x 20..... 5.75
Extra Central, IC, 14 x 20.... .....5.62½
Flag, IC, 14 x 20..... 5.25
Flushing, IC, 14 x 20..... 7.00
Freeport (Hand dipped and Resquared), IC, 14 x 20 ..... 7.50
IX, 14 x 20..... 8.75
Globe, IC, 14 20 x 28 .....11.00
Hamilton's Best Redipped, IC, 14x20 9.25
" " " IX, 14x20 10.75
Hickory (Resquared), IC, 14 x 20..6.12½
Juno, IC, 14 x 20..... 5.75
Kensington, IC, 14 x 20..... 6.75
" IX, 14 x 20..... 8.00
Knoxall, IC, 14 x 20 ..... 6.00
Laufman's Apollo (Resquared), IC, 14 x 20..... 8.12
Laufman's Apollo (Resquared), IX, 14 x 20..... 9.37
Leominster, Extra Coated, IC, 14x20 7.25
Lion (Stamped), IC, 14 x 20..... 6.25
Lula, Best Charcoal, IC, 20 x 28....12.50
" " " IX, 20 x 28....16.00
Manhattan, IC, 14 x 20..... 7.00
Maple, IC, 14 x 20..... 6.50
Merchant's Roofing (Resquared), IC, 14 x 20..... 8.25
Meurer Roofing, IC, 14 x 20..... 8.50
" " IX, 14 x 20.....10.50
Newcastle Real Old Method, IC, 14x20, 9.50
" " " IX, 14x20, 11.50
Newcastle Genuine Extra Coated, IC, 14x20, 8.75
" " " IX, 14x20, 9.75
Newcastle Shenango, IC, 14x20....6.12½
" " IX, 14x20....7.62½
Neville, IC, 14 x 20..... 6.00
" IX, 14 x 20..... 7.25
N. F. Old Style, IC, 14 x 20..... 7.50
" " IX, 14 x 20..... 9.00
Old Colony, IC, 14 x 20..... 8.00
Optimus, Best Redipped, IC, 14 x 20 8.25
" " IX, 14 x 20 9.50
Osceola, Hand Coated, IC, 14 x 20.. 8.25
" " IX, 14 x 20.. 9.75
Pacific, IC, 14 x 20..... 5.25
Palaclo, IC, 14 x 20..... 5.55
Pennsyl Old Method (Treble Coated), IC, 14 x 20..... 8.00
Phœnix, IC, 14 x 20..... 5.62½
Pullman, IC, 14 x 20..... 6.50
Scott's Extra Coated (Resquared), IC, 14 x 20..... 9.25
Scott's Extra Coated (Resquared), IX, 14 x 20.....10.75
Stanley, IC, 14 x 20..... 5.50
Superior, IC, 14 x 20..... 5.25
Taylor Old Style (Resquared), IC, 14 x 20..... 9.25
Taylor Roofing, IC, 14 x 20..... 8.00
Thomson's Puritan, IC, 14 x 20.....5.75
Tip Top, IC (Resquared), 14 x 20.... 6.00
" IX " 14 x 20.... 7.25
U. S. Monongahela, IC, 14 x 20..... 6.10
U. S. Redipped, IC, 14 x 20..... 8.25
Venus, IC, 14 x 20 .....5.37½
Vigilant, IC, 14 x 20 .....5.50
Waldo Redipped, IC, 14 x 20..... 6.75
Westmoreland, IC, 14 x 20..... 6.25
Willow, IC, 14 x 20..... 6.25

American Bright Plates—

Almond, IC, 14 x 20.....$6.25
Brilliant (Tissue Packed), IC, 14x20. 9.00
Brooklyn, IC, 14 x 20..... 5.50
Climax, IC, 14 x 20..... 6.00
" IX, 14 x 20. ..... 7.50
Excelsior, IC, 14 x 20..... 6.50
" IX, 14 x 20.. ..... 7.50
Florence, IC 14x20... ..... 6.75
Florida, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Hazel, IC, 14x20..... 6.50
Iowa, IC, 14 x 20..... 5.75
" IX, 14 x 20..... 7.00
Linden, IC, 14x20..... 6.50
Merchant's Dipped, IC, 14x20.....11.00
Merion, IC, 14x20.. ..... 6.75
Mint, IC, 14x20..... 6.00
Newcastle Russia, IC, 14 x 20..... 7.00
" " IX, 14 x 20..... 9.00
Newcastle Jnniati, IC, 14 x 20..... 6.50
" " IX, 14 x 20.. .. 8.50
Newcastle Best Coke, IC, 14 x 20.... 6.00
" " IX, 14 x 20.... 7.25
Newcastle Coke, IC, 14 x 20..... 5.50
" IX, 14 x 20..... 6.75
Palma Xtra, IC, 14x20..... 7.00
Phœnix, IC, 14x20..... 6.25
" IX, 14x20..... 7.75
Royal, Extra, IC, 14x20..... 7.00
U. S., IC, 14x20 .. .. 7.25
Versailles, IC, 14 x 20 ....5.75
Youghlogheny, IC, 14 x 20... ... .6.00

Imported Terne Plates—

Charcoal.

MF Grade, IC, 14 x 20.....$7.50
20 x 28..... 15.00
IX, 14 x 20..... .... 8.75
20 x 28.....17 50
Pontymister Grade, IC, 14 x 20..... 6.50
20 x 28.....13.00
IX, 14 x 20..... 7.50
20 x 28.....15.00
Worcester Grade, IC, 14 x 20.....$5.75
20 x 28.....11.50
IX, 14 x 20..... 6 75
20 x 28.....13.50
Dean Grade.—IC, 14 x 20..... .. ... 5.40
20 x 28.....10.80
IX, 14 x 20..... 6.40
20 x 28.....12.80
Ahercarne Grade.—IC, 14 x 20..... 5.25
20 x 28.....10.50
IX, 14 x 20..... 6.40
20 x 28.....12.80

Imported Bright Plates—

Charcoal.
Duty: 2.2¢ ₩ ℔.

Melyn and Calland Grade. IC, 10 x 14..... $6.35
" " IC, 12 x 12..... 6.60
" " IC, 14 x 20..... 6.35
" " IC, 20 x 28..... 12.70
" " IX, 10 x 14..... 8.00
" " IX, 12 x 12..... 8.20
" " IX, 14 x 20..... 8.00
" " IX, 20 x 28..... 17.00
" " DC, 12½ x 17..... 6.00
" " DX, 12½ x 17..... 8.00
Allaway Grade. IC, 10 x 14..... 5.75
" " IC, 12 x 12... .... 5.85
" " IC, 14 x 20..... 5.75
" " IC, 20 x 28..... 11.50
" " IX, 10 x 14..... 7.00
" " IX, 12 x 12..... 7.25
" " IX, 14 x 20..... 7.00
" " IX, 20 x 28..... 14.00
" " DC, 12½ x 17..... 5.50
" " DX, 12½ x 17..... 6.50

Coke.

Steel Coke.—IC, 10x14, 14x20..... 5.35
10x20..... 8.25
20x28.....11.00
IX, 10x14, 14x20..... 6.60
B. V. Grade.—IC, 10x14, 14x20..... 5.40

Imported Boiler Plates—

IXX, 14x26..(112 sheets).....$13.85
IXX, 14x28..(112 sheets)..... 14.50
IXX, 14x31..(112 sheets)..... 16.00

Tinning—

Brass and Copper.....net

Tubing—

Tin.....55%
Galvanized.....55%

Brass and Copper.—

Standard List.....25@30%

Troughs, Eave—See *Eave Troughs.*

Trucks, Stove—

Improved Lock Frame, per doz.... $15.00
Steel Lock Frame, per doz..... 18.00
Daisy Improved Pattern, ₩ doz.... 18.00

Wrought Iron Pipe—

1¼ and under, Plain.....60&10&5%
1¼ and under, Galv.....50&10&5%
1½ and over, Plain.....70&10&5%
1½ and over, Galv.....60&10&5%
Boiler Tubes, list Oct. 24, 18..2..70&10&5%
Casing, list Nov. 16, 1892.....52½%
Inserted Joints Casing, list Nov. 16, 1892.....47½%
Steel Boiler Tubes.....27½%
Cold Drawn Seamless Steel Tubing...50%

Zinc—

600 ℔ casks..... ₩ ℔ 5½¢
Per ℔.....6¢

It Is Reported—

Colorado.

That the Hardware store of Maxwell Bros., ROCKY FORD, was burglarized on the 13th inst.; $60 worth of goods were taken.

Illinois.

That Scharlach & Weidner are now carrying on the Hardware business formerly conducted by Zeller & Kahney, CISSNA PARK. They have just completed a large Implement addition to their store, 24 x 70 feet, two stories high.

That George Smith of MACKINAW has completed his new brick building, and has moved his Tin and Hardware stock into it.

That Phelps & Waite have bought out O. T. Bartholomew's Hardware stock at ROCKTON.

That $50 worth of goods were stolen from the Hardware store of Bothwell & Hopkins, CLAY CITY, on the night of the 14th inst.

That on the 7th inst. burglars visited the store of H. L. Reid, at BUDA, and carried off about $50 worth of Cutlery.

Iowa.

That Chas. Meddaugh & Son of GAINES have sold their Hardware stock to J. W. Dawson of CLEAR LAKE, who will continue the business at the old stand.

That James Kennedy of OTTUMWA has opened a new Hardware store.

Kansas.

That on the 16th inst. $75 worth of goods were stolen from the Hardware store of Peebler & Barr of MERIDEN.

That P. A. Morrison is the proprietor of a new Hardware store at HEPLER.

Michigan.

That George T. Corning, Hardware merchant, of IRON MOUNTAIN, has removed his stock to larger and more commodious quarters.

Minnesota.

That Ambrose Eynon's Hardware store, at STEWART, was burglarized on the 16th inst.; $200 worth of Revolvers, Razors and Knives were taken.

That A. W. Mertens of NEW PRAGUE has removed to KOCHICHING FALLS, where he intends to enter the Hardware and lumber business.

Missouri.

That O. F. Tomlinson of EDGERTON has purchased the Hardware stock of Messick & Dryden of LIBERTY, and will continue the business with John W. Ross as manager.

That Gurley & Son's Hardware stock, at PURDY, was destroyed by fire on the 13th inst. The Implement stock was not damaged. Loss, $8000; insurance, $2000.

That S. Brumley of the Hardware firm of Brumley & Painter, LAMONTE, has purchased his partner's interest and will continue the business alone.

New York.

That the wholesale Hardware firm of J. H. Van Duzer & Co., NEWBURGH, was dissolved by mutual consent on May 28. E. B. Taylor has retired from the business, which will hereafter be conducted by J. H. Van Duzer, E. C. Van Duzer and W. E. Sayer, under the same firm style as heretofore.

Ohio.

That Geo. Rich of JEFFERSON has purchased a one-third interest in the Hardware firm of Bradley, Monk & Co. of Columbus.

Price-Lists, Circulars, &c.

C. SIDNEY SHEPARD & CO., 23–25 Randolph street, Chicago: Terne Plates for roofing. This 12-page pamphlet is a beautiful specimen of typography and engraving, inclosed in a pale green cover bearing the firm's name and business stamped in red letters on a silver ground, representing a sheet of Roofing Terne. It contains an illustrated list of the special brands of American and foreign roofing Ternes made for and sold by the company. These include, among domestic Plates, Westmoreland, a full weight, heavily coated Plate, squared and stamped; Kenwood, a full weight, bright finished Terne; Furmston, a Terne of Worcester grade, and Apollo. Of imported Plates, the well-known brands Worcester, Morriston Old Style and Pontymister Old Style are illustrated and described.

THE CINCINNATI MFG. COMPANY, Cincinnati, Ohio: Bank Railings. Elevator Inclosures, Achitectural Brass and Wire Work, &c. A catalogue of 51 pages illustrates, with prices and descriptions, Wire, Iron and Brass Work, Stable Furniture, Bank Railings and Grilles, Wire and Iron Fences, Weather Vanes, Roof Cresting and Finials, Vases, Settees and Chairs, &c.

NEW YORK BELTING & PACKING COMPANY, 15 Park Row, New York: "Buried Treasure." This is the second of a series of booklets issued by the company and treats of their Leatherite Cotton and Test Carbolized Rubber Fire Hose. These goods are described, their particular features and advantages being prominently brought to notice.

LABOR EXCHANGE.

Notices under this heading of reasonable length are inserted free of charge. Only those relating to employment are admitted. Write distinctly on one side of paper only, and do not use postal cards.

HELP WANTED.

SALESMAN having trade in foundry supplies and calling upon foundries to sell on large commission molders' tools; best and most complete line in America. Box 35, office of *The Metal Worker*, 59 Dearborn street, Chicago, Ill. June 30

A first-class PLUMBER who understands hot water heating. S. Woodhead & Bro., North Adams, Mass. June 30

An experienced HOT AIR FURNACEMAN, capable of taking charge of the manufacture and erection of hot air furnaces, in an established plant. The Huntington Heating & Ventilating Company, Central City, W. Va. June 30

Two SALESMEN on commission for Southern territory; those who visit hardware and crockery trade can handle our large line from catalogue and pocket sample and make a fair thing of it. "Staples," office of *The Metal Worker*, 96-102 Reade street, New York City. June 30

A good TINSMITH, who can do general jobbing, roofing and spouting and make up tinware; must be used to country work and a hustler: to the right man a good place; new business is to be developed. Lock Box 135, Havre de Grace, Md. June 30

A good TIN and SHEET IRON WORKER and FURNACE HAND with some knowledge of plumbing; a steady job is guaranteed to the right man; must be of good habits; state experience, age and wages. G. J. Llewellyn, Pittston, Pa. June 30

GENERAL and BUSINESS MANAGER wanted for large steel casting concern, with large, important specialties; only those familiar with the manufacture of steel and of proved high executive and business ability need apply. Wilson, 51 *Tribune* Building, New York City. June 30

At once, a good TINSMITH and PLUMBER who can do general jobbing and roofing and make up tinware; must be of good habits; state experience, age and wages. Solenberger & Stouffer, Winchester, Va. June 23

Live, energetic salesman on commission, to handle sanitary appliances manufactured in vitreous china; no objection to one handling other lines, but must be thoroughly acquainted with master plumbers. Maryland Pottery Company, Baltimore, Md. June 23

SITUATIONS WANTED.

By a mechanical engineer of experience, as SUPERINTENDENT, MANAGER and OFFICE ASSISTANT to manager of manufacturing concern; understands modern methods of manufacture. iron and brass foundry work, metal pattern making, steam and hot water heating; best of references. "C.," 5519 Morris street, Germantown, Pa. June 30

By a first-class TINSMITH, ROOFER and GENERAL JOBBER; best of references; city or country. "J. K.," care of Lefkovigs, 255 Stanton street, New York City. June 30

By a FURNACE WORKER and GENERAL JOBBER; no roofing; city or country. "M. M.," 420 East Twenty-sixth street, New York City. June 20

To travel in Missouri or Illinois, by competent stove, range or tinware salesman; 12 years' experience; strictly temperate; A1 references. J. B. Smith, 16 Masonic Temple, Indianapolis, Ind. June 30

By middle aged man, experienced and competent, to take charge of tin works, galvanizing, lead cutting; can put in plant. D. R. Jenkins, Newcastle, Pa. June 30

By a PLUMBER and GAS FITTER; city or country; wages $2.75 per day. Albert Dour, 491 Tenth avenue, New York City. June 30

By a PLUMBER, 22 years of age, in city or country. Address, stating wages, "H. A. R.," Box 123, Irvington, N. Y. June 30

By a young man, as CORNICE MAKER; also understands tin and sheet iron work; steady position desired. Ph. Balogh, 131 Grecne street, New York City. June 30

By a practical TIN and SHEET IRON WORKER and CORNICE MAKER; can cut patterns and do roofing; steady work desired; wages moderate. Max Weiss, 244 Stanton street, New York City. June 30

By a thoroughly practical MECHANIC; well up on experimental work; competent to design and make cutting, stamping and combination dies, small tools, jigs, &c., for manufacturing hardware specialties and brass goods in the most economical manner; nine years as foreman; best of references furnished. "Pattern Maker," 360 Twenty-sixth street, Chicago, Ill. June 30

By a first-class SHEET IRON WORKER, on heavy work; an all around man. J. M. Fitz, 442 West Forty-second street, New York City. June 30

An A1 MACHINIST, 26 years of age, expert on lathe, desires a permanent position; German; married. Chas. Bertrang, Carlstadt, N. J. June 30

By an experienced MACHINIST; good references; willing to work at most anything. Geo Miller, 110 North Henry street, Brooklyn, E. D., N. Y. June 30

By a CORNICE and SKYLIGHT MAKER; nine years' experience in cornice works; three years as foreman. "L. D. R.," Cornice Maker, 111 Delancey street, New York City. June 30

As STEAM ENGINEER or HELPER. Max Bersinsky, 141 Forsyth street, New York City. June 30

Steady position desired by a young man 26 years of age, as CORNICE CUTTER or ASSISTANT FOREMAN in a good shop; city or country. "L. D. R.," 111 Delancey street, New York City. June 30

By a young man with six years' experience in hardware business, as stock clerk, order clerk and salesman; references from the largest wholesale and retail hardware store in New England; position desired in New York State or Connecticut. "Greene," 19 Waltham street, Boston, Mass. June 30

A good practical HOT WATER and STEAM HEATING MAN desires a position with a good firm; competent to estimate on all kinds of heating plants. "Heatiug," office of *The Metal Worker*, 96-102 Reade street, New York City. June 30

Steady position desired by a TIN and SHEET IRON WORKER; accustomed to inside and outside work; iuside work preferred. Thomas Wall, 200 Navy street, Brooklyn, N. Y. June 30

As SUPERINTENDENT of stamping works or FOREMAN die or tool maker; 35 years of age; last six years in similar position with leading firm; thoroughly posted in sheet metal of all kiuds; highest references. "Tools," care Rudolphi & Krummel, 96 North Clinton street, Chicago, Ill. June 23

Steady job in a HARDWARE STORE and tin store or tin shop; can make ordinary tinware goods, or roofing and spouting; best of bahits. J. H. Bowers, Wakerton, Ind. June 23

As SALESMAN in a hardware or iron house; 20 years' experience in shelf and heavy hardware, tinners' stock, iron and carriage goods. "Storrs," office of *The Metal Worker*. Rooms 22-24 Pickering Building, Cincinnati, Ohio. June 23

By a first-class PLUMBER who understands gas and hot water fitting; steady; sober; married; steady position desired; town or country. 37 Chestnut street, Yonkers, N. Y. June 23

As FOREMAN in an iron foundry, by a practical molder used to green and dry sand molding; can give good references. "Molder," No. 614, office of *The Metal Worker*, 96-102 Reade street, New York City. June 23

By a first-class PLUMBER, in city or country; neat lead worker; can furnish first-class references from last employers. Robert Edwards, 64 Grove street, New York City. June 23

By a first-class PLUMBER; city or country. C. J. Smallen, 64 West 101st street, New York City. June 23

First-class PLUMBER desires steady work; 25 years' experience; city or country. John Pratt, 630 Third avenue, New York City. June 23

By a first-class PLUMBER, STEAM and HOT WATER FITTER; can estimate and read plans; steady employment desired; wages moderate; first-class references; sober; married. "J. H. K.," 2501 Broadway, Kansas City, Mo. June 23

By a young man, who is capable of doing plumbing and gas fitting, roofing, guttering and spouting, range and pump work; can come well recommended; wages moderate for steady job; city or country. J. E. Moran, Box 21, Marlborough, N. Y. June 23

By a TINSMITH; in and out door worker; good hand on furnaces, ranges, heaters and roofing; some knowledge of plumbing; a good situation desired. Schneider, 288 Broome street, New York City. June 23

By a TINSMITH; willing to go anywhere. S. Soltzman, 146 Essex street, New York City. June 23

By a young man of experience, as TRAVELING SALESMAN; thoroughly acquainted with the hardware and house furnishing trade in Ohio, Michigan and Indiana; best of references; salary no object at start; permanent situation desired. "Smith," 530 Fourteenth avenue, Detroit, Mich. June 23

By a practical first-class PLUMBER; 15 years' experience; seven years in one shop; understands plans; first-class references; city or country; no objections to go South. Jos. Usher, 427 East 114th street, New York City. June 23

By a competent man of nine years' experience in the STEEL RANGE and FURNACE BUSINESS in all its branches; strictly temperate. John M. Blaydes, 2917 Thomas street, St. Louis, Mo. June 23

As FOREMAN or SUPERINTENDENT in a cornice and roofing shop; a first-class cutter and draftsman; also understands estimating on all kinds of cornice, tin and sheet iron work; have 20 years' experience; can give best of references. "Cutter," No. 62, office of *The Metal Worker*, 96-102 Reade street, New York City. June 23

By a first-class American STEAM FITTER and HOT WATER FITTER; married and temperate; very best of references given. "Steam Fitter," care of W. A. Taylor, 39 Myrtle street, Worcester, Mass. June 23

By a BRASS FINISHER; soft and hard solderer; city or country. S. Klein, care Mrs. Braun, 168½ Attorney street, New York City. June 23

By a TINSMITH, ROOFER and GENERAL JOBBER; will work for moderate wages; town or country. John Buckley, 109 Asterdam avenue, New York City. June 23

By a young man with eight years' experience at the tinners' trade; understands roofing, plumbing and furnace work; used to country work. "Tinsmith," 269 West Thirty-seventh street, New York City. June 23

By a first-class STOVE MOUNTER, DRILLER and FITTER, also PATTERN FITTER; six years' experience as foreman in one shop. Henry Guyer, 375 Central avenue, Albany, N.Y. June 23

By a practical TIN and SHEET IRON WORKER, who has learned his trade in Germany; capable of doing all work in the above line; 12 years' experience; city or country. Louis Kreutzman, 345 East Sixty-fifth street, New York City. June 23

By a TINNER and CORNICE MAKER; can cut patterns and do roofing, gas fitting, heater and furnace work; steady work desired; wages moderate. Edward Johnson, Cairo, Ill. June 23

PLUMBER, a first-class man, 12 years' city experience, desires position out of New York City; will furnish very best reference. Alex. Gillespie, 135 West 101st street, New York City. June 23

By a thoroughly practical TIN, SHEET IRON and COPPER MAKER who understands roofing, furnace and iron pipe work and general new inside and outside work; 13 years' experience; 27 years of age; strictly temperate; capable of buying and selling hardware, house furnishing goods, &c.; moderate salary. P. O. Box 100, Hartford, Conn. June 23

By a TINNER who can do roofing, bench and furnace work; temperate and reliable; not afraid of work; would like a steady position where he could learn pipe fitting; Massachusetts preferred. "Tinner," 141 Cabot street, Lowell, Mass. June 23

By a first-class TINNER who can do cornice work and assortment ware; can cut patterns. Fred. Frelvozel, 83 Walker street, Cincinnati, Ohio. June 23

By a practical, all around MECHANIC in all branches of the tinsmith trade; can do roofing, piping, furnace and pump work and general jobbing; capable of taking charge of shop; steady and reliable; married. "German," care A. Maass, 339 East Twenty-second street, New York City. June 23

By a young man 21 years of age, as PLUMBER; three years' experience and four months' course in the New York Trade School; would like to work under instructions for a year; will furnish own tools. Wm. Peterson, 341 Park avenue, Hoboken, N. J. June 23

TIN and SHEET IRON WORKER accustomed to inside and outside work would like a steady job; inside work preferred; wages moderate. Thomas Wall, 200 Navy street, Brooklyn, N. Y. June 23

By a first-class PLUMBER in all branches of the trade; quick and neat worker; country preferred. P. J. Dervin, 159 West Sixty-sixth street, New York City. June 16

In New York City or Brooklyn, by an A1 TIN and SHEET METAL WORKER; thoroughly familiar with range and furnace work in all its details; is employed at present, but would like to make a change; can furnish the best of references "M. W. P.," office of *The Metal Worker* 96-102 Reade street, New York City. June 16

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A No. 6 second-hand Root's Blower. State how long in use, iron paddles or wooden paddles. Address

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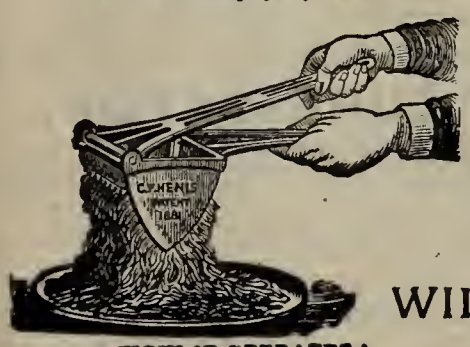
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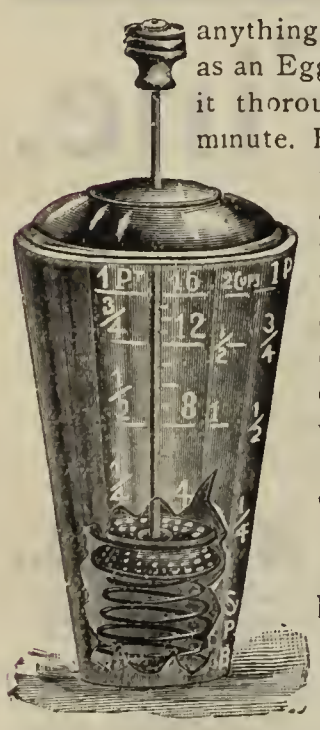
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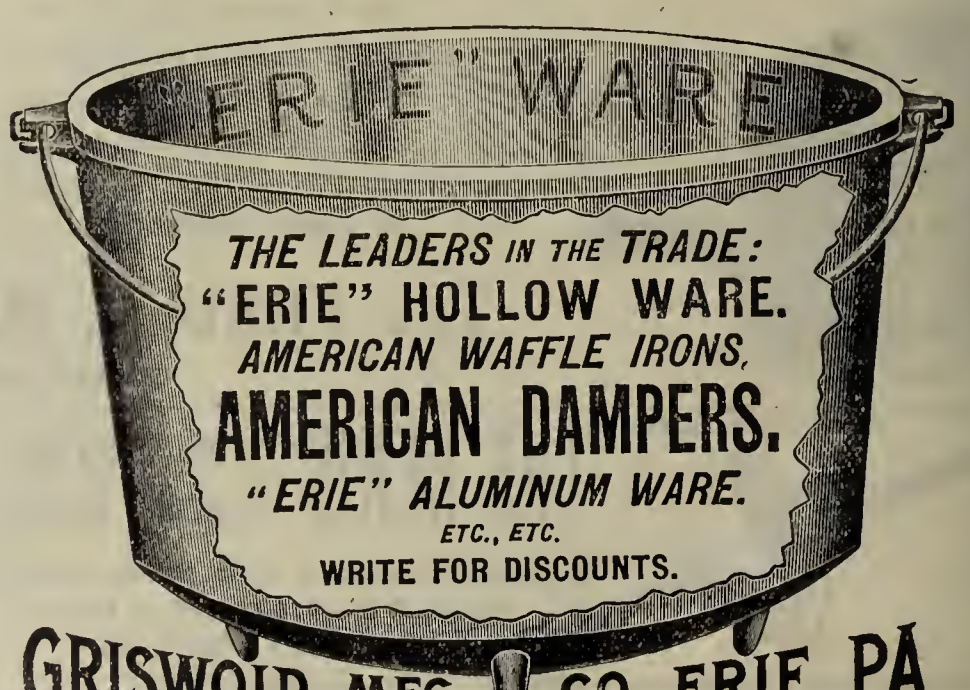
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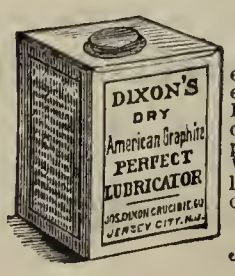
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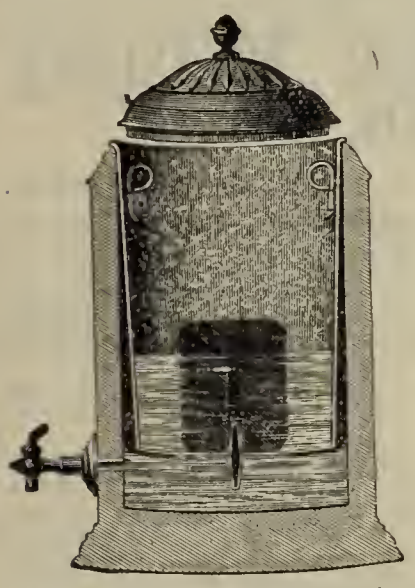
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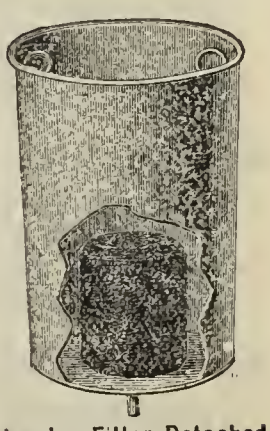
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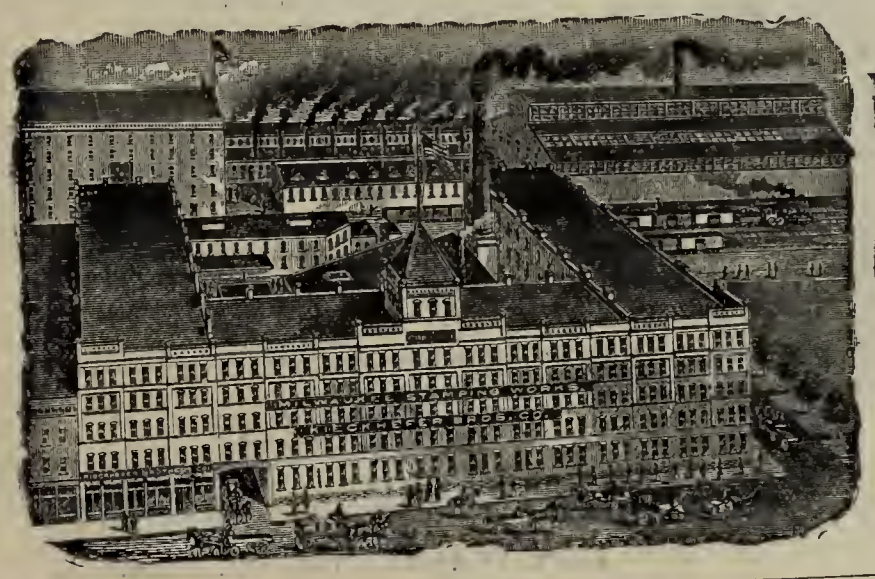


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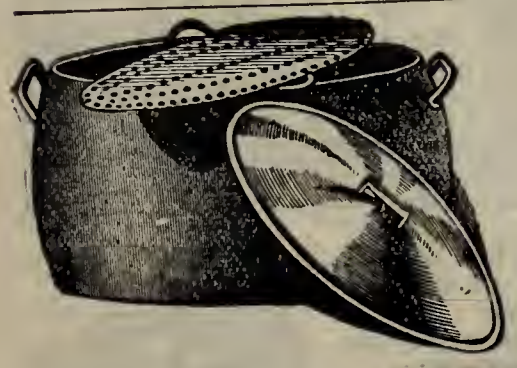
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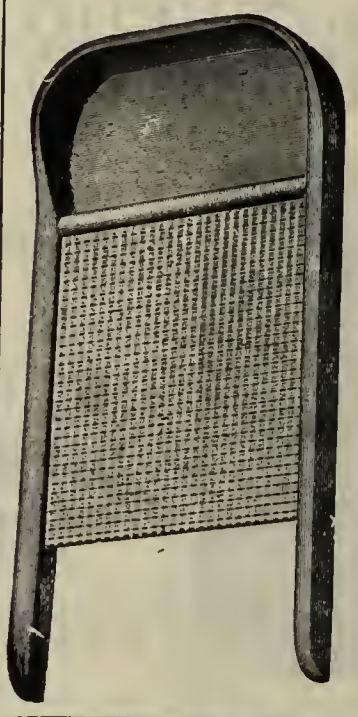
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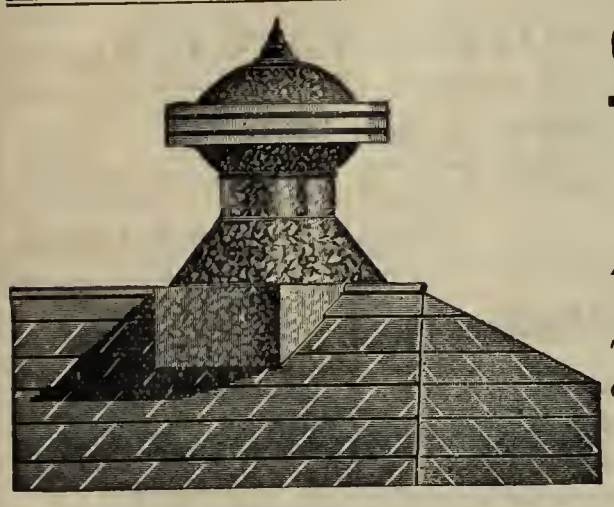
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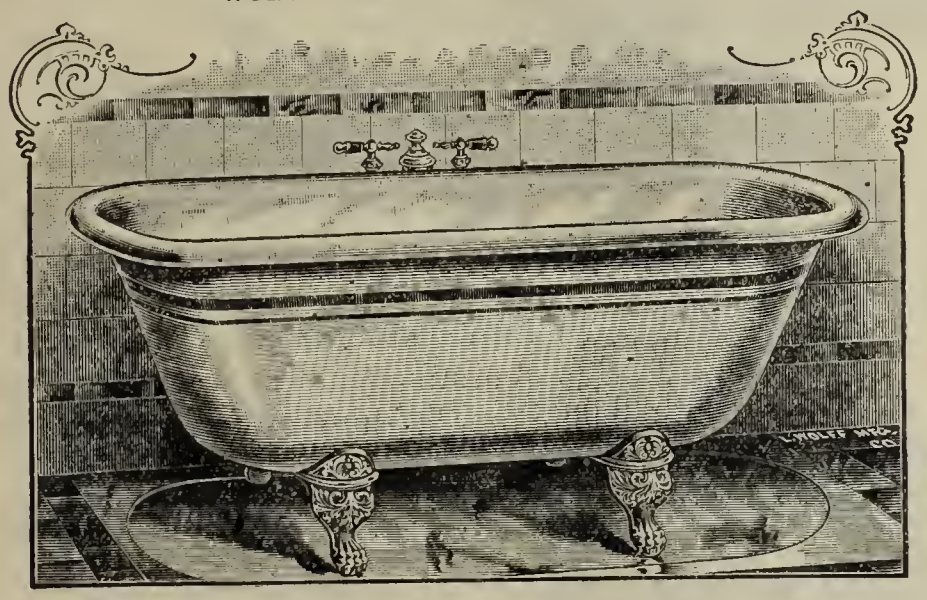
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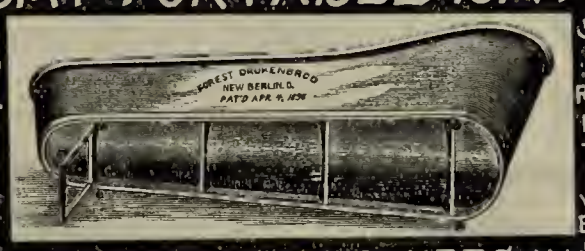
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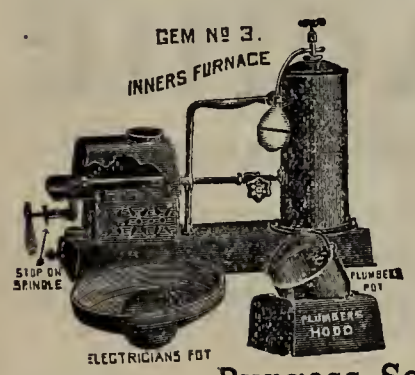
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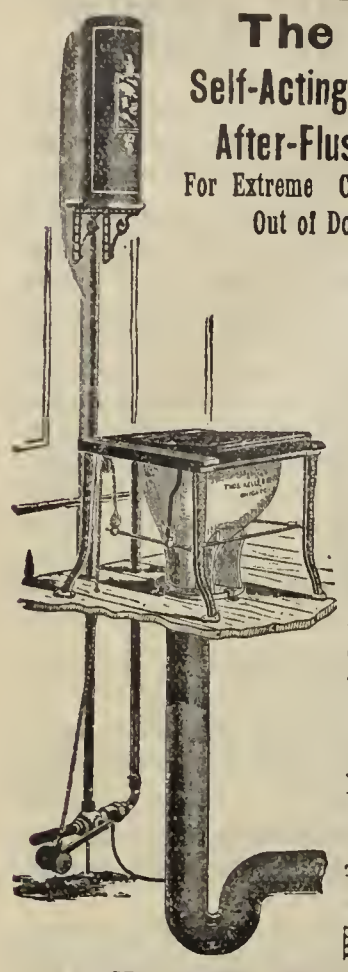
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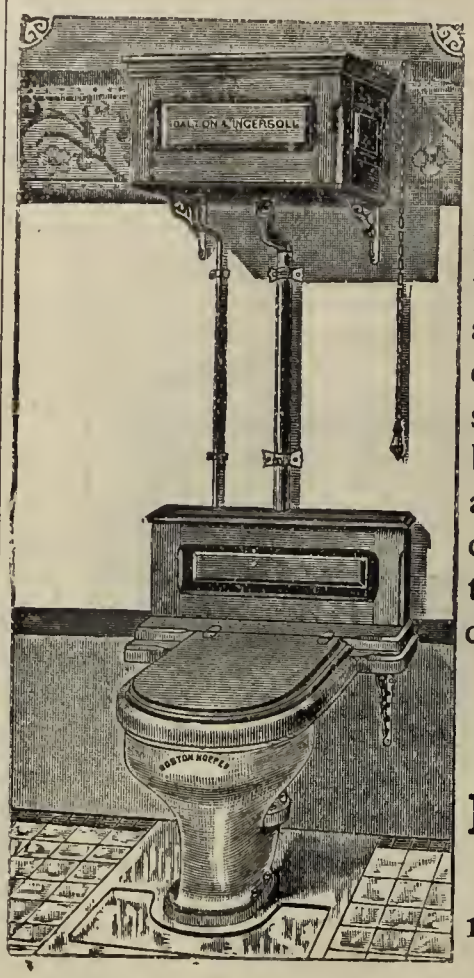
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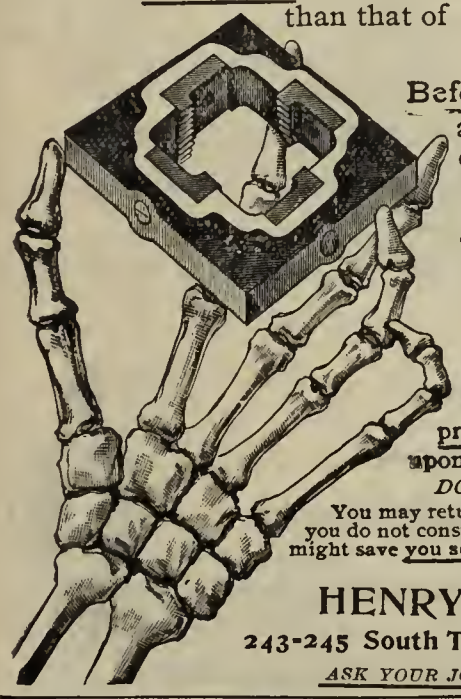
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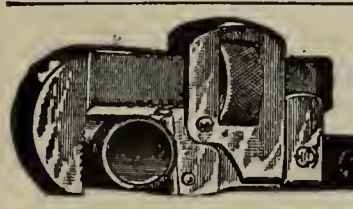
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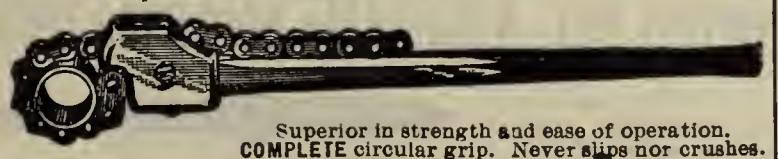
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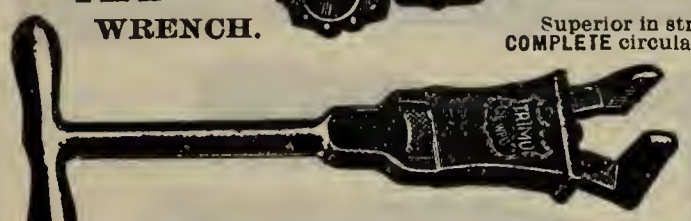
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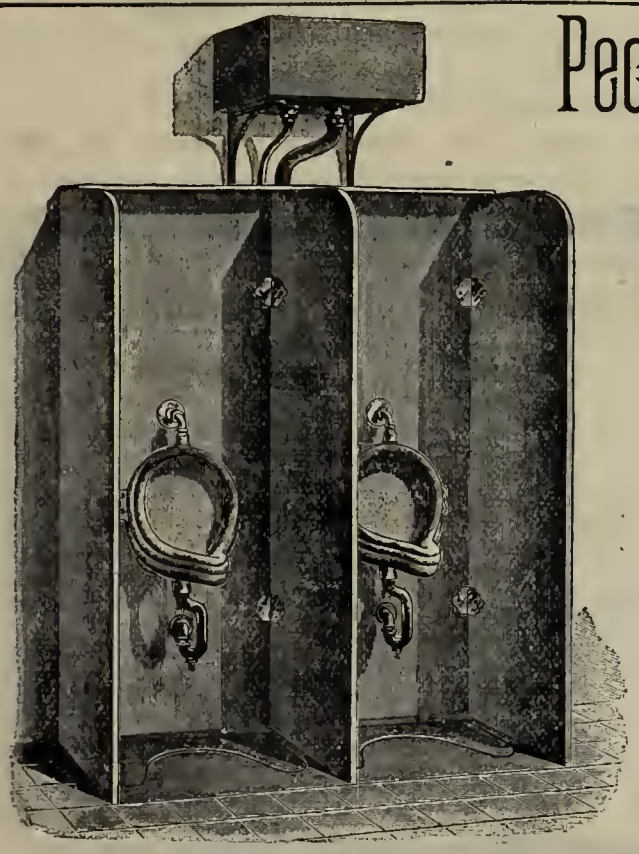


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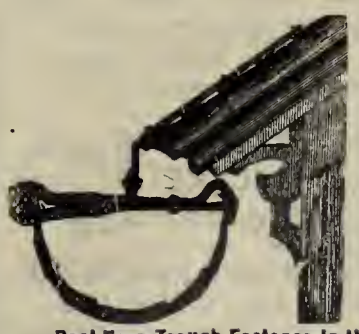
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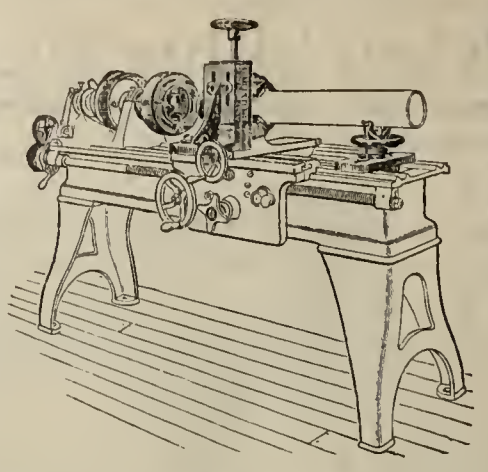
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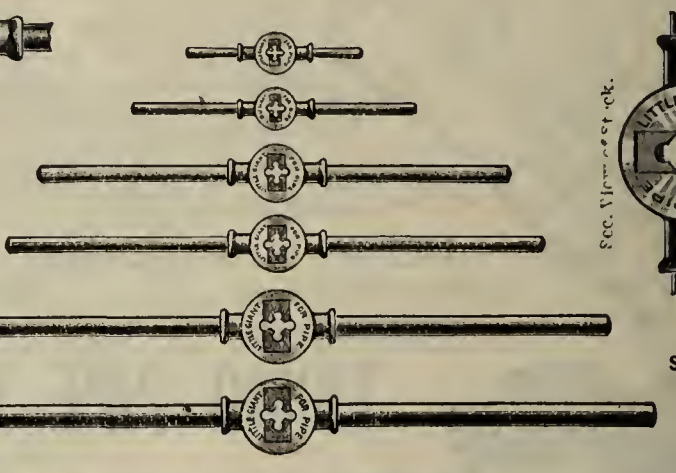
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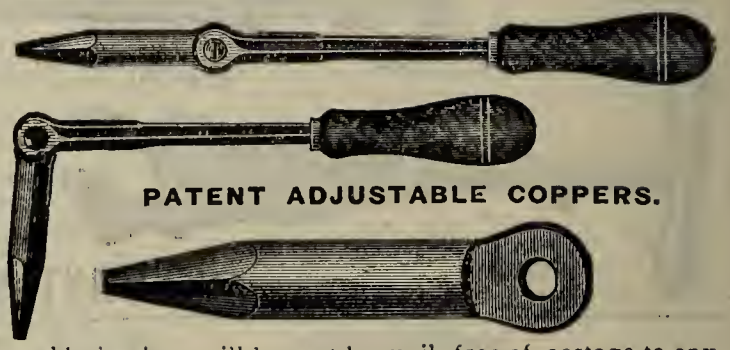
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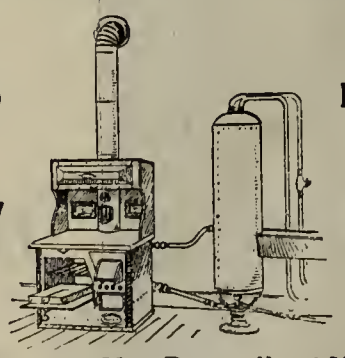
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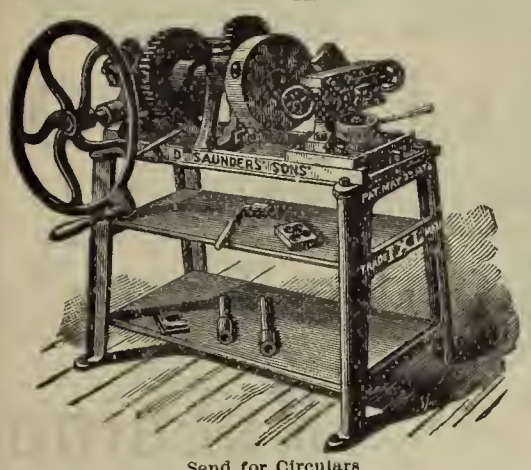
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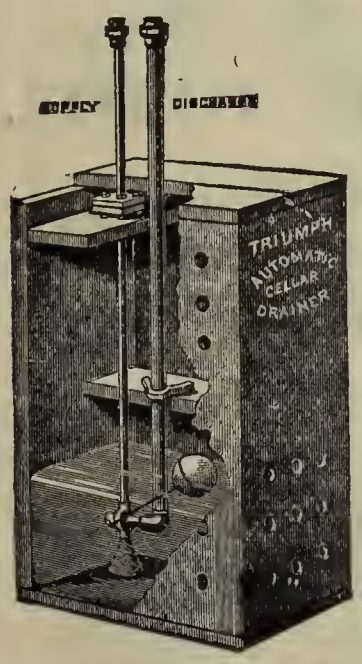
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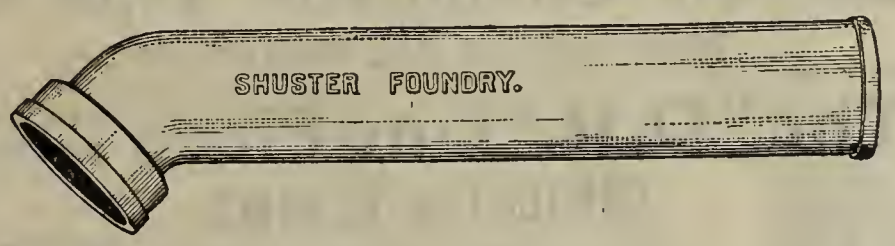
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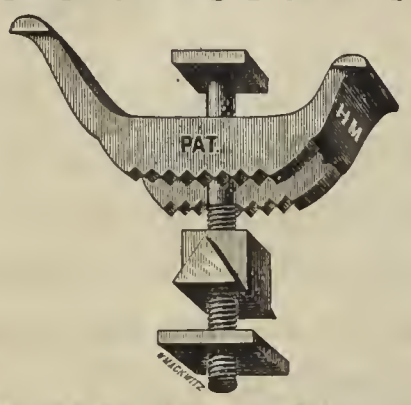


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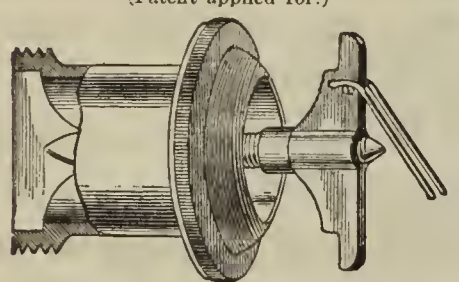
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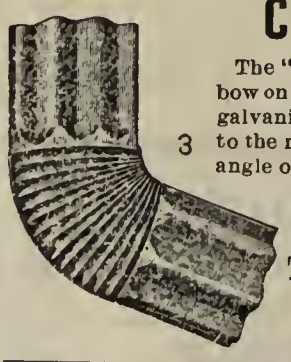
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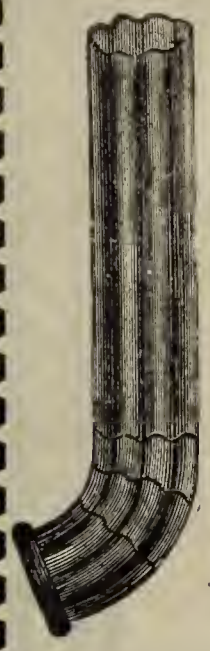
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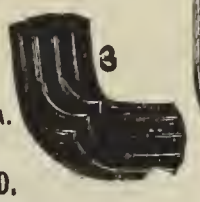
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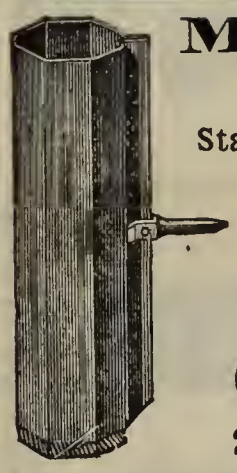
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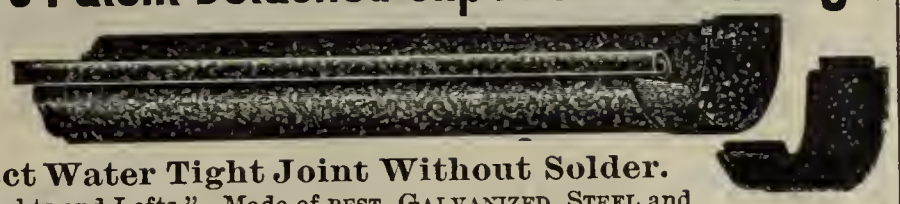
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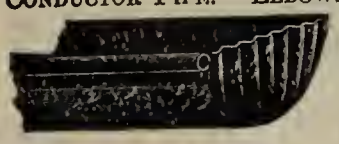
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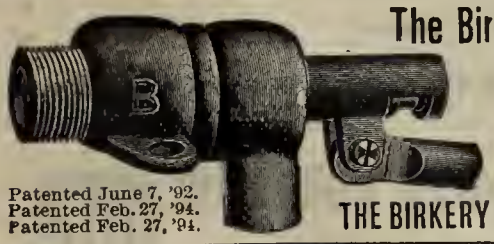
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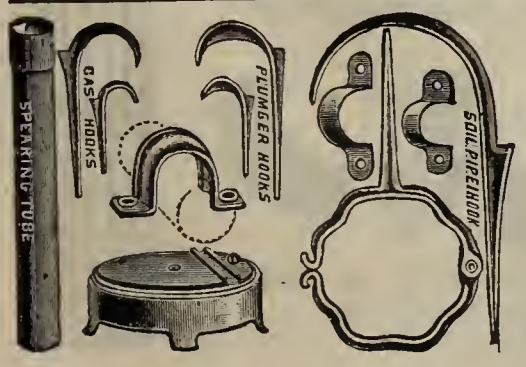
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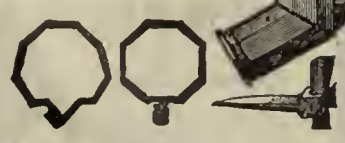
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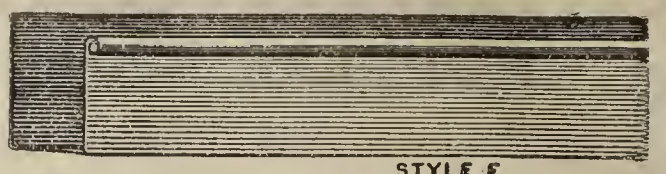
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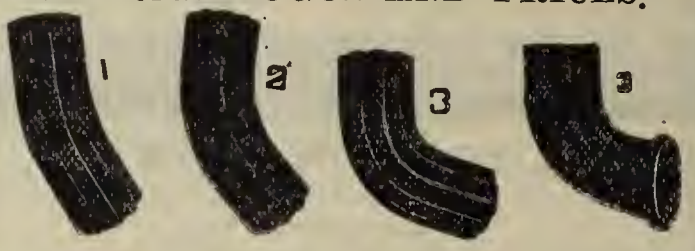
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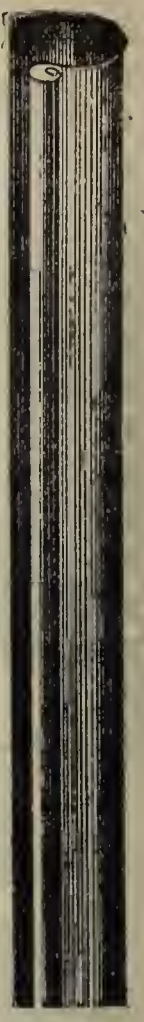
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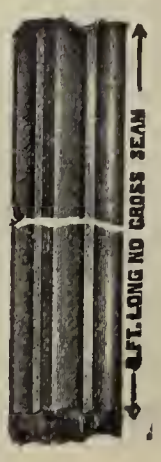


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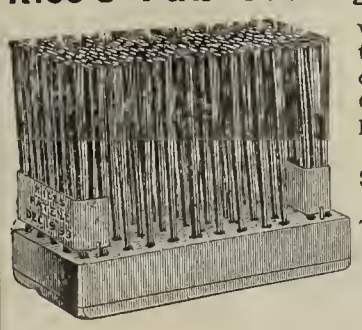
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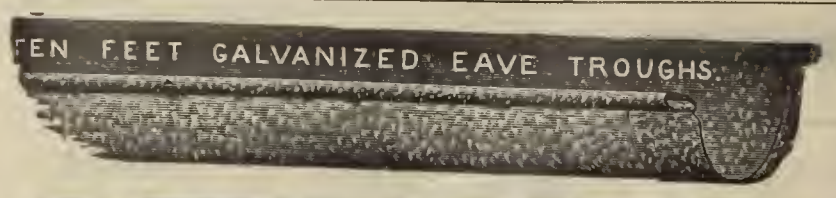
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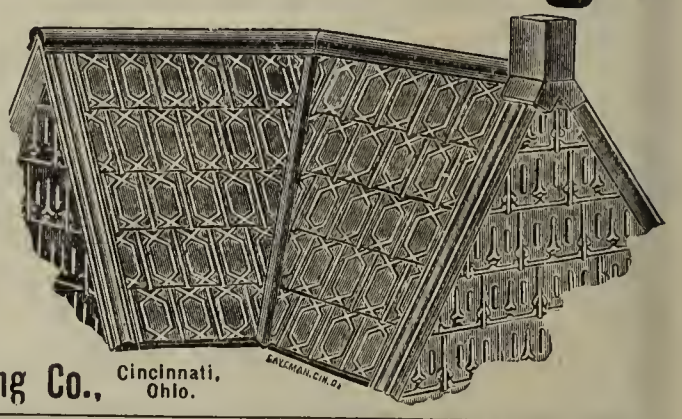
We have had a number of inquiries for copies of the table giving the net price of galvanized sheet iron which was printed in *The Metal Worker* April 7. We have therefore issued the table in more permanent form, published on manilla card suitable for shop and office use. The card will be sent on receipt of 10 cents by

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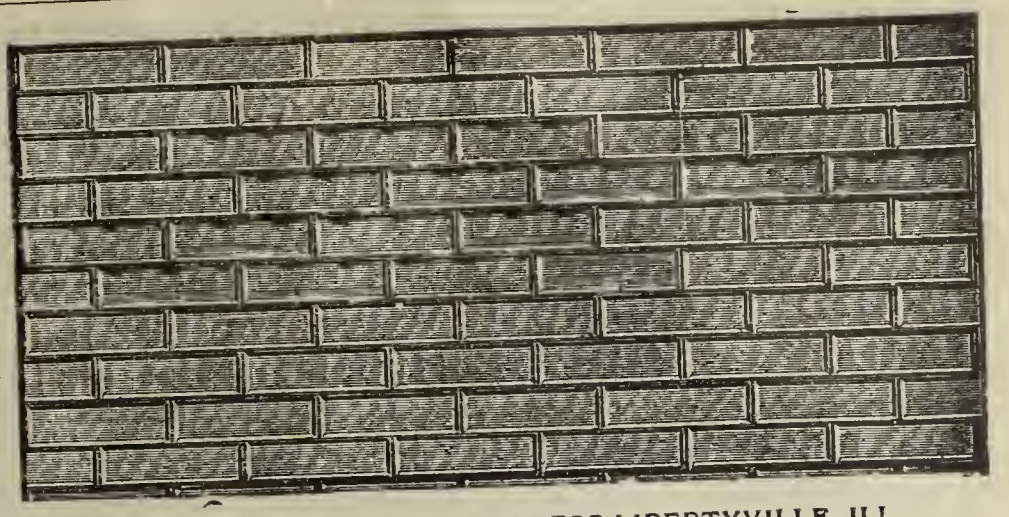
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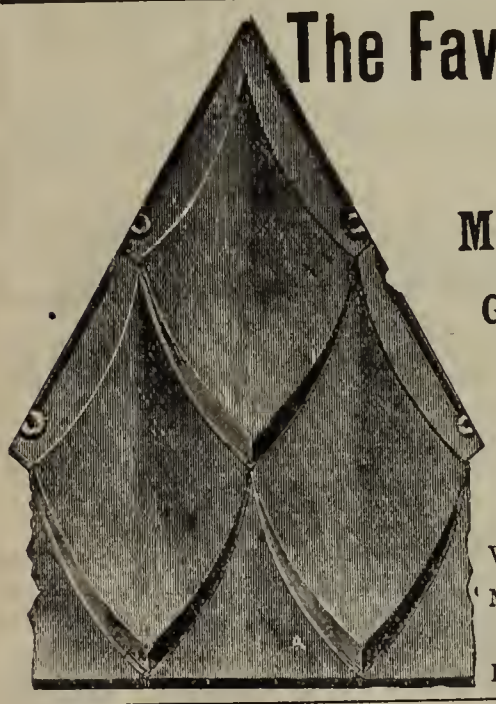
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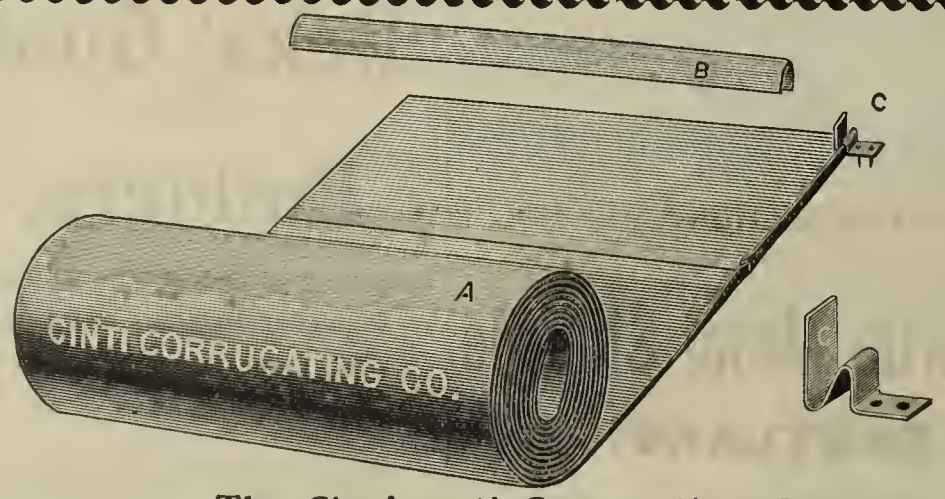
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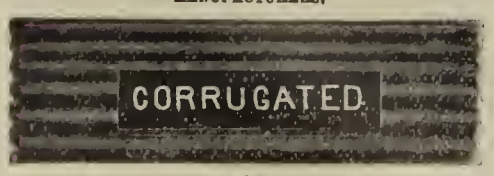
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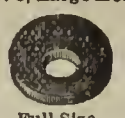
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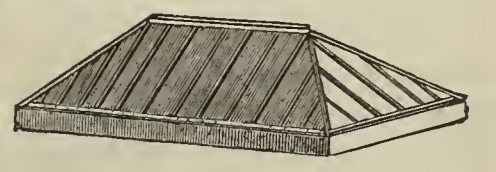
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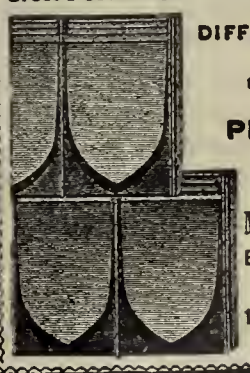
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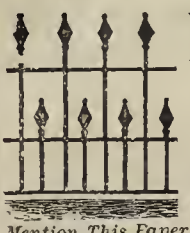
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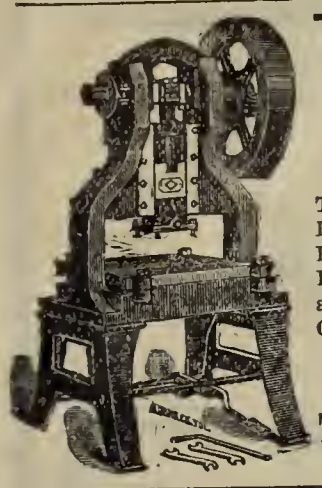
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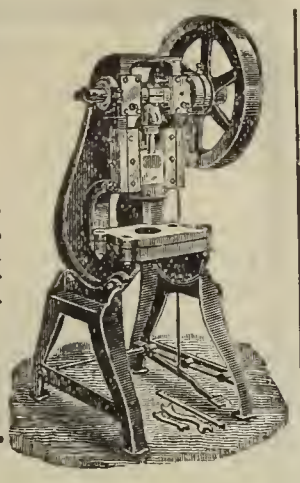
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FIG. 1



FIG. 2.



FIG. 3.



FIG. 4.

Fig. 1. Represents pipe set up and is perfectly smoke tight.
Fig. 2. Represents an end view of pipe and shows construction of seam.
Fig. 3. Represents top of joints spread and packed for shop or domestic use.
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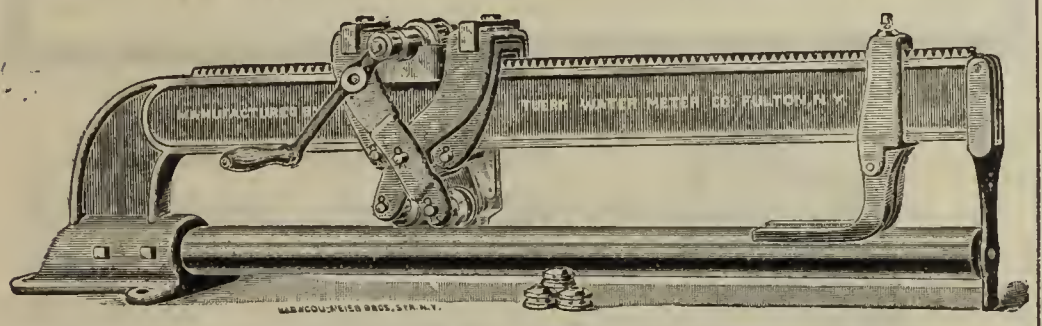
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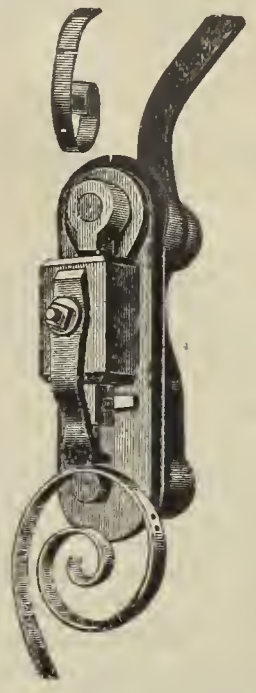
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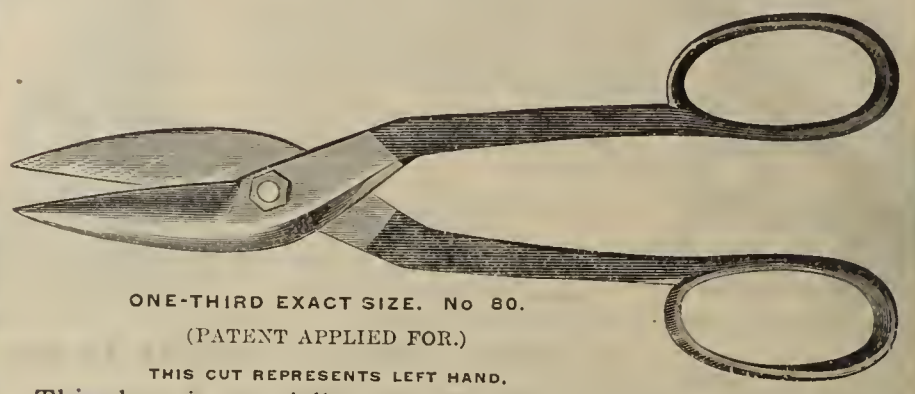
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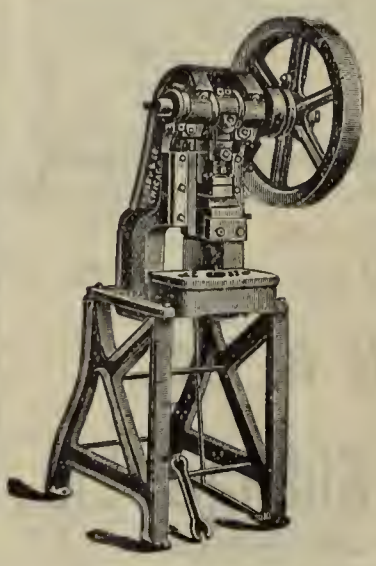
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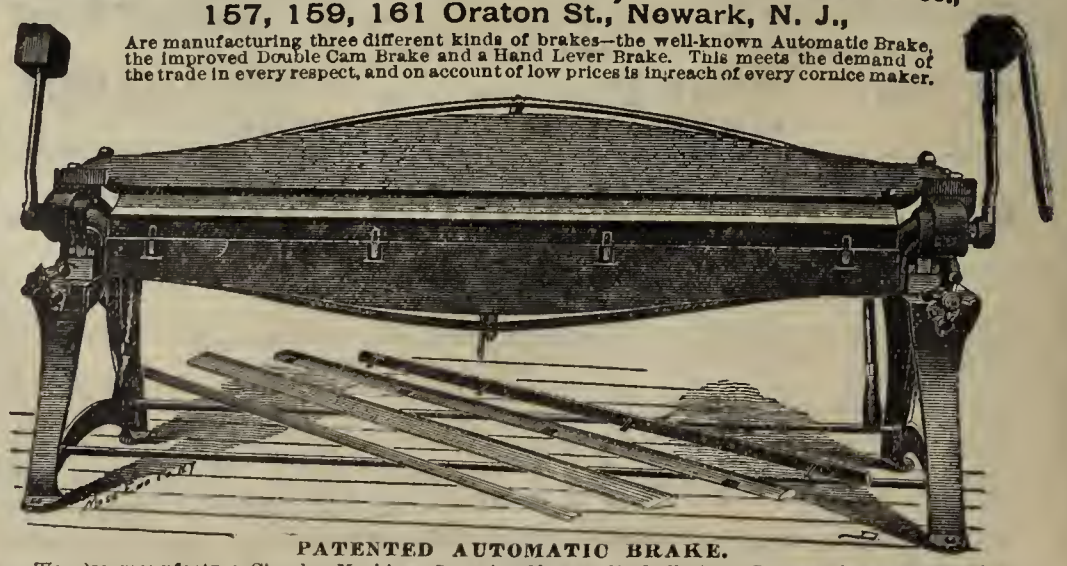
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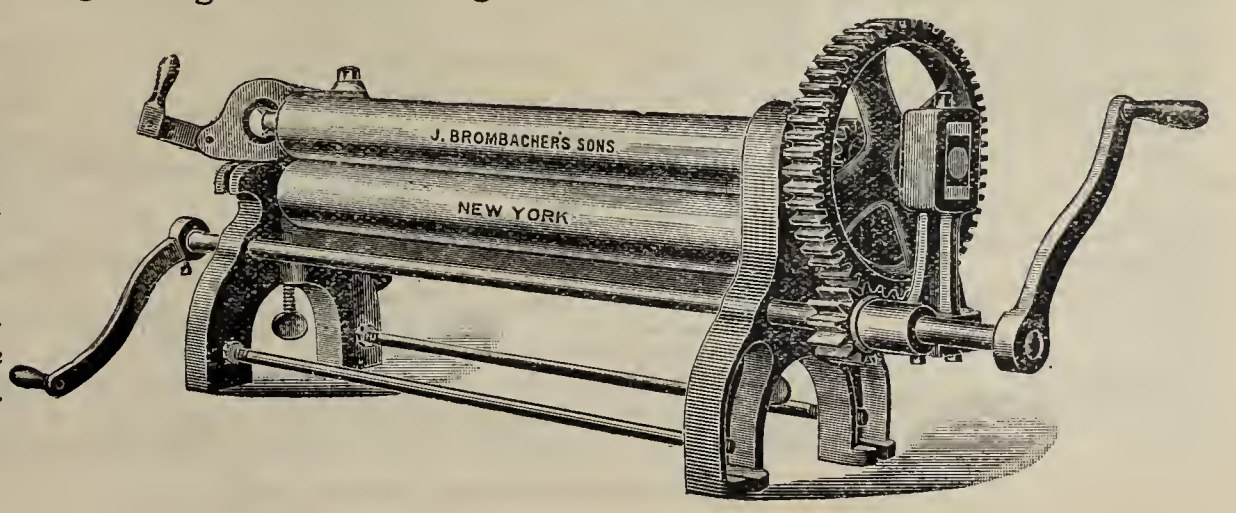
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Allen's Cornice & Corrugating Works, Chicago, Ill.
American Roofing Co., Cincinnati, O.
Bischoff, F. F. & Co., Chicago, Ill.
Bowers, Galpin & Co, Binghamton, N. Y.
Cambridge Roofing Co., Cambridge, O.
Canton Steel Roofing Co., Canton, O.
Cincinnati Corrugating Co., Piqua, O.
Columbia Corrugating Mfg. Co., Niles, O
Columbia Roofing Co., Canton, O.
Eller, J. H. & Co., Canton, O.
Fostoria Steel Rfg. Co., Canton, Ohio.
Globe Iron Roofing & Corrugating Co., Cincinnati, O.
Gummey, Spering & Co., Philadelphia, Pa.
Haldeman, N. A. & Co., Phila., Pa.
Holton Iron Roofing Co., New Lisbon, O.
Jersey City Galvanizing Co., 112 John St., N. Y.
Kanneberg Roofing Co., Canton, Ohio.
Kansas City Metal Roofing and Corrugating Co., Kansas City, Mo.
Miller, J. A. & Bro., Chicago, Ill.
N. Y. Iron Roofing & Corrugating Co., Jersey City, N. J.
Penn Iron Roofing and Corrugating Co., Ltd., Philadelphia, Pa.
Rhodes, Dickelman & Co., Forest, O.
St. Louis Corrugating Co., St. Louis Mo.
Sanderson & Peckham, Detroit, Mich.
Souther, E. E. Iron Co., St, Louis, Mo.
Sykes Iron & Steel Roofing Co., Chicago, Ill.

Roofing Machines.
Lyon, Conklin & Co., Baltimore, Md.

Roofing Nails.
Salem Nail Co., 292 Pearl St., N. Y.

Roofing Slate.
Auld & Conger, Cleveland, O.
Bangor Excelsior Slate Co., Bangor Pa.
Emack, J. D., Philadelphia, Pa.
Galt, John & Sons, 253 Broadway, N. Y.
Johnson, E. J. & Co., 38 Park Row, N. Y.

Sad Irons, Gas.
Bolgiano Mfg. Co., Baltimore, Md.

School of Instruction.
Correspondence School of Mechanics, Scranton, Pa.

Sheet Metal Machinery.
Bliss, E. W. Co., Brooklyn, N. Y.
Brombacher's Sons, Jacob, 30 Cliff St., N. Y.
Crosby, G. A. & Co., Chicago, Ill
Dover Machine Works, Dover, Del.

SEE ALPHABETICAL INDEX, PAGE 83.

Keene, Geo. C. & Co., Cincinnati, O.
Miner & Peck Mfg. Co., New Haven Conn.
Niagara Stamping & Tool Co., Buffalo, N. Y.
Ohl, Geo. A. & Co., Newark, N. J.
Robinson, J. M. & Co., Cincinnati, O.
Stark Machine & Tool Co., Buffalo N. Y.
Stiles & Parker Press Co., Brooklyn N. Y.
Toledo Machine & Tool Co. Toledo, O.
Tuerk Water Meter Co., Fulton, N. Y.

Shingles and Tiles, Metallic.

Bischoff, F. F. & Co., Chicago, Ill.
Burton, W. J. & Co., Detroit, Mich.
Cincinnati Stamping Co., Cincinnati, O
Cortright Metal Roofing Co., Philadelphia, Pa.
Garry Iron and Steel Roofing Co., Cleveland, O.
Merchant & Co., Inc., Philadelphia, Pa.
Montross Metal Shingle Co., Camden, N. J.
Penn Iron Roofing and Corrugating Co., Phila., Pa.
Sanderson & Peckham, Detroit, Mich.
Van Noorden, E. & Co., Boston, Mass.

Shot.

Colwell Lead Co., 63 Centre St., N. Y.

Skylights.

Miller, J. A., & Bro., Chicago, Ill.

Slater's Tools.

Auld & Conger, Cleveland, O.
Galt, Jno. & Sons, 253 Broadway, N. Y,
Salem Nail Co., 292 Pearl St., N. Y.

Snow Guards.

Halliday, M., East 9th St., N. Y.

Solder.

Bruce & Cook, 186 to 190 Water St., N. Y
Gummey, Spering & Co., Philadelphia, Pa.
Lang, E. M. & Co., Portland, Me.
Meurer Bros. Co., Brooklyn, N. Y.
Taylor, N & G. Co., Philadelphia, P

Soldering Irons.

Covert Mfg. Co., W. Troy, N. Y.

Speaking Tubes and Whistles.

Ostrander, W. R. & Co., 204 Fulton St. N. Y.

Statuary, Sheet Metal.

Mullins W. H., Salem, O.

Steam & Gas-Fitters' Supplies.

Curtis & Curtis, Bridgeport, Conn.
Kieley, T., 7-11 West 13th St., N. Y.
Nason Mfg. Co., 71 Beekman St., N. Y.
Pancoast, Henry B. & Co., Philadelphia, Pa.

Stove and Metal Polish.

Globe Ventilator Co., Troy, N. Y.
Tarbox Mfg. Co., New London, Conn.
Yates & Co., Rockford, Ill.

Stove Linings.

Marcy Stove Repair Co., 74 Beekman St., N. Y.
Presby Stove Lining Co., Taunton, Mass.
Rutland Fire Clay Co., Rutland, Vt.
Valentine, M. D. & Bro. Co., Woodbridge, N. J.

Stove Patterns.

Bascom, H. Clay, Troy, N. Y.
Calely, Edw. L., Philadelphia, Pa.
Cincinnati Pattern Wks., Cincinnati, Ohio.
Cope, G. W., Detroit, Mich
Gobielle, W. M., Cleveland, Ohio.
Gobielle Pattern Co., Cleveland, O.
McLaughlin, John K., Philadelphia, Pa.
Vedder Pattern Works, Troy, N. Y.

Stove Pipe.

Ruth, Patterson & Ruth, Alliance, O.

Stove Pipe Thimbles.

Bretch, A., Dayton, O.
Cheney, S. & Son., Manlius, N. Y.
Stearns, E. C. & Co., Syracuse, N. Y.

Stove Repairs.

Brauer, A. G., St. Louis, Mo.
Marcy Stove Repair Co., 74 Beekman St., N. Y.

Stove Trimmings, &c.

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N. Y. Nickel Plating & Mfg. Co., 227 and 229 West 29th St., City.
Troy Nickel Works, Troy, N. Y.

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Stellwagen & Kynoch, St. Ignace, Mich.

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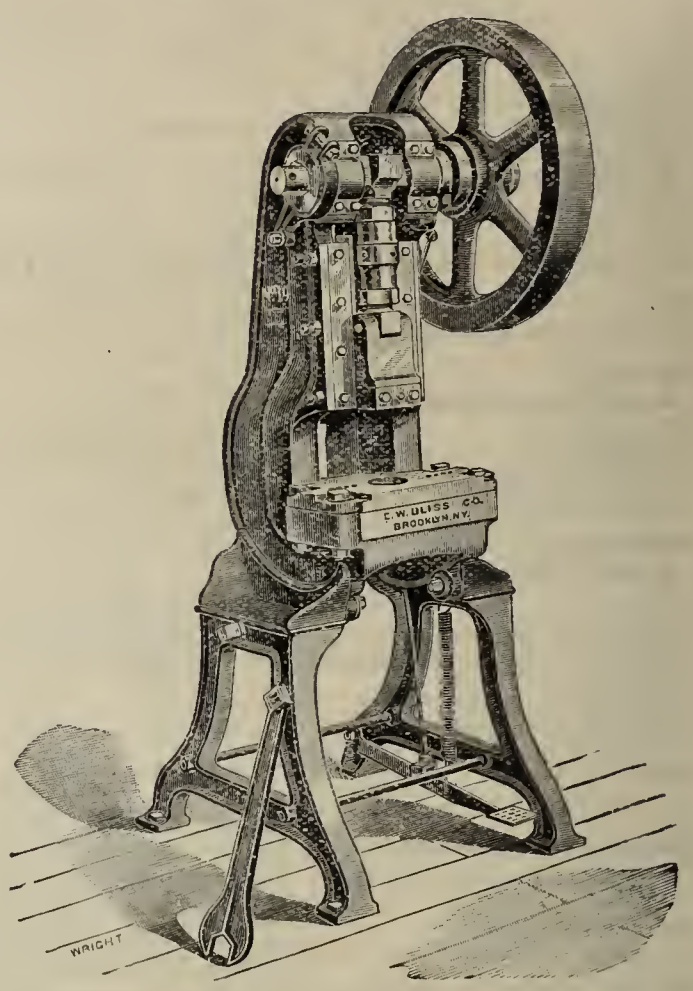
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The success of the effort to give the lists in small space is illustrated in many of the lists, in which a clear and condensed arrangement is secured. For instance, the wrench list occupies but 3 inches by ¼ inch, while the list of Stove Hollow Ware, in very small space, gives the list prices on a large and important line of goods which often occupy several pages in catalogues. In several lists, such as Strap and T Hinges and Butts, a new arrangement is adopted, which is regarded as presenting these lists in a very convenient as well as condensed form.

As is obvious from the lists herewith reproduced, the shape and size of the different lists varies greatly, the aim being to give each list the smallest and most convenient arrangement possible. None of the lists are, however, more than 3½ x 6 inches in size, very few of them being as large as this and most of them very much smaller. In use it is intended that they shall be trimmed closely before they are inserted in price books, when they may be attached either by one edge close to the hinge of the book, as will, perhaps, be most convenient with the larger lists, permitting the use of the entire page for memoranda, or the smaller lists may be pasted on the page in connection with the entries in regard to discounts, freights, &c. Many of the lists are so compact in arrangement as when thus inserted to leave ample room for recording quotations.

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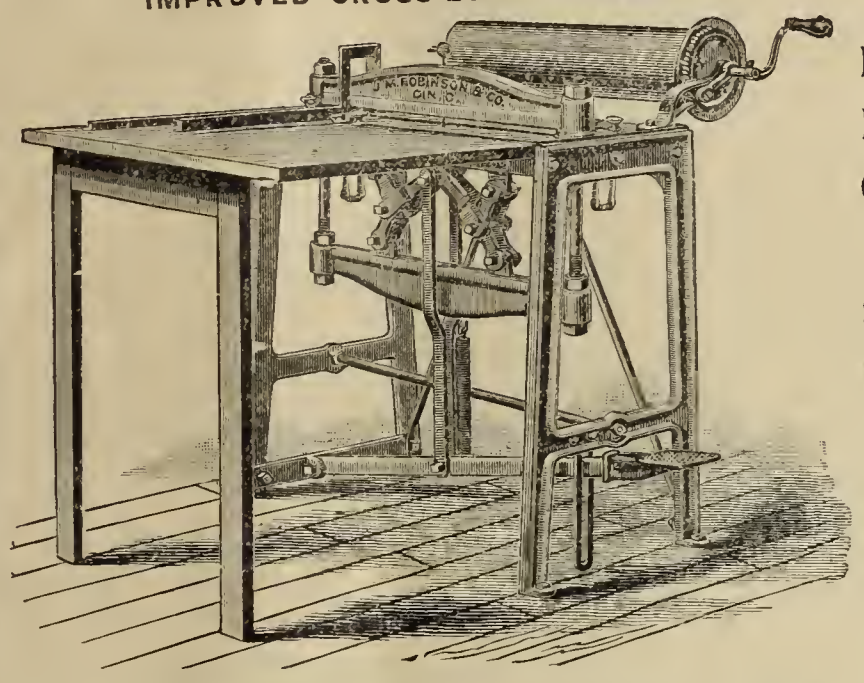
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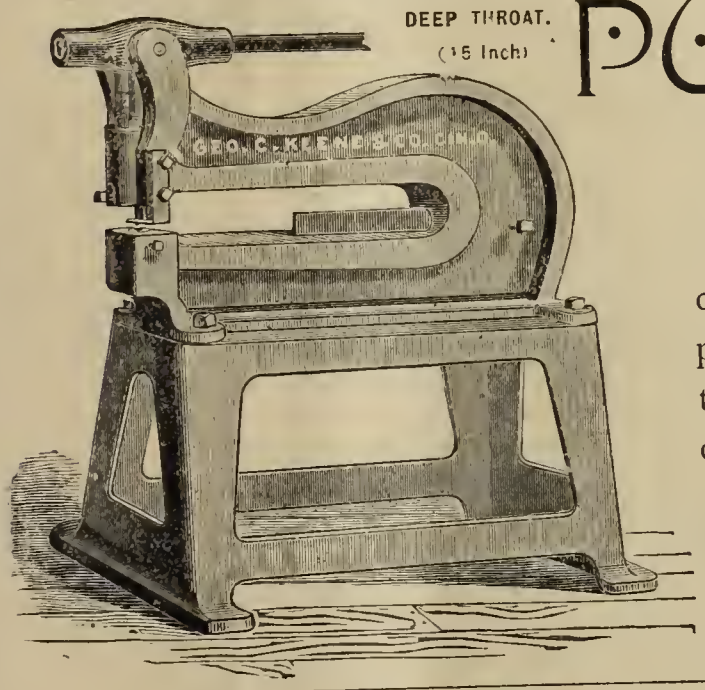
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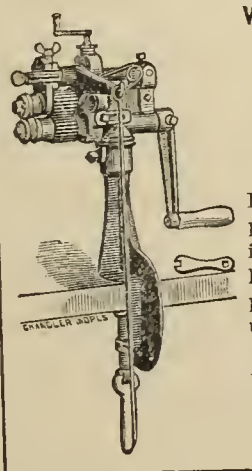


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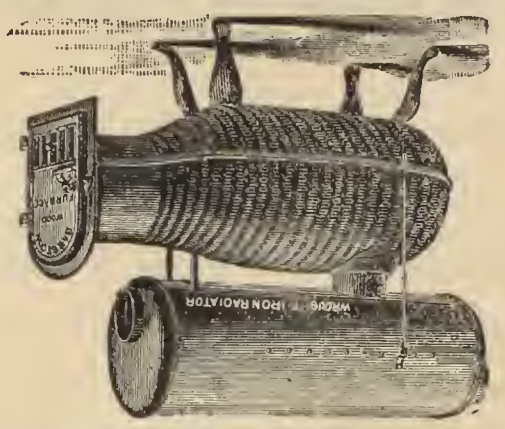
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